Final Environmental Assessment

Construction and Operation of Little River Canyon Field School in DeKalb County, Alabama

Early concept design for Little River Canyon Field School near Little River Falls along Highway 35 east of Fort Payne, Alabama.

Prepared for
Jacksonville State University

by

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ENVIRONMENTAL ASSESSMENT
CONSTRUCTION AND OPERATION OF LITTLE RIVER CANYON FIELD SCHOOL

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Preface
Environmental Assessment Organization

This environmental assessment (EA) addresses the Jacksonville State University's (JSU's) proposed action to construct and operate a new facility, The Little River Canyon Field School (LRCFS), in DeKalb County, Alabama.

The United States Congress, through NASA, under FY 2003 Appropriations Bill for the Department of Veteran Affairs, Housing and Urban Development and Independent Agencies, UNITED STATES PUBLIC LAWS 108th Congress - First Session Convening January 7, 2003 PL 108-7 (HJRes 2) CONSOLIDATED APPROPRIATIONS RESOLUTION, 2003 has appropriated funds to build an educational training facility, as an outreach of JSU, called LRCFS. Therefore, as required by the National Environmental Policy Act, the potential environmental effects of implementing this action are analyzed.

The **Executive Summary** briefly describes the proposed action and potential environmental consequences.

Section 1: Purpose of and Need for the Proposed Action summarizes the purpose of and need for the proposed action and discusses the scope of the document.

Section 2: Description of the Proposed Action and Alternatives describes the proposed action and the alternatives to the proposed action.

Section 3: Affected Environment describes the existing conditions of each resource for which the proposed action and alternatives to the proposed action are evaluated.

Section 4: Environmental Consequences presents the potential effects of implementing the proposed action and alternatives to the proposed action on the resources described in section 3, as well as mitigation measures.

Section 5: References presents bibliographical information about the sources used to prepare the EA.

Section 6: List of Preparers provides information about the persons who prepared the EA.

A **List of Acronyms** is provided in appendix D.

Appendixes
A: Wetland Delineation and Protected Species Survey
B: Clean Air Act Applicability Analysis
C: Cultural Resources Survey
D: Acronyms

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Executive Summary

Introduction

The United States (U.S.) Congress, through a National Aeronautics and Space Administration (NASA) facility grant, proposes to provide funds to Jacksonville State University (JSU) for constructing a new facility, Little River Canyon Field School (LRCFS) in DeKalb County, Alabama.

JSU's commitment to providing affordable and accessible educational opportunities and the continued success of programs conducted in or around the Little River Canyon National Preserve and DeSoto State Park have led to the need for a dedicated facility to support education related to NASA's Earth Science Enterprise. The new LRCFS would provide the surrounding communities with a wide range of programs, primarily related to Earth sciences and the environment. The facility would include a reception/orientation area, permanent displays, a changing exhibit gallery, an audio/visual (A/V) miniauditorium, laboratories, conference and meeting areas, office space, and community conference multiuse space.

NASA is required to analyze the environmental consequences of this action under the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S. Code [U.S.C.] 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 *Code of Federal Regulations* (CFR) Parts 1500 through 1508), and NASA regulations (14 CFR Part 1216 Subpart 1216.3). This environmental assessment (EA) has been prepared in accordance with these regulatory requirements and is consistent with NASA Procedural Requirements (NPR 8580.1) for implementing NEPA.

Proposed Action

The new LRCFS is proposed to be constructed on a 50-acre undeveloped site, owned by JSU, located in DeKalb County, Alabama. Construction of the facility is scheduled to begin in early 2005 and would be completed in approximately 1 yr. Operation of the new LRCFS will not require any new personnel, only relocation of existing personnel.

Alternatives to the Proposed Action

Siting of the LRCFS required identifying a site that is proximal to the Little River Canyon area, of sufficient size to accommodate the space requirements of the new facility, and easily accessible. Renovation or expansion of the existing facilities at JSU to incorporate a school dedicated to the Little River Canyon area was not considered a viable alternative to the proposed action because of distance. JSU is located approximately 60 miles south of Little River Canyon, therefore the drive to and from scheduled activities would have severely limited the number of participants in the school's programs.

The proposed construction site, owned by JSU, is conveniently located adjacent to the Little River National Preserve, providing the necessary space and environment required for the LRCFS, in a location close to the area of study. As a result, the proposed construction site has been determined to be the only site that meets all of the siting criteria for the new LRCFS.

No-Action Alternative

The no-action alternative is to maintain existing conditions, i.e., not to construct the new facility.

Conclusions

A new field school in the Little River Canyon area is needed to enhance JSU's educational outreach opportunities in the area. The preferred alternative of constructing and operating the new facility at the proposed sites and the no-action alternative have been evaluated in this EA with respect to numerous natural, cultural, physical, and socioeconomic resources.

The preferred alternative of constructing and operating the new facility at the proposed site is not expected to have a significant adverse effect on any resource evaluated in this EA. The potential effects of the preferred and no-action alternatives are summarized in table ES–1.

On the basis of an analysis conducted for the proposed action, estimated air emissions from the construction and operation of the facilities are not expected to significantly affect air quality. Ambient noise levels at and around the construction sites would temporarily increase during construction of the facility. On the basis of U.S. Environmental Protection Agency (EPA) estimates of noise dissipation, noise levels during construction are expected to be within or below the residential acceptable range in the residential areas nearest to the construction site. Noise levels generated during the operation of the new facility would be below the residential acceptable range in these communities. No portion of the proposed construction site for the LRCFS is located within the 100-yr floodplain. While there are four wetlands within the 50-acre site, none are within the 2–3-acre construction site. Likewise, six cultural resources locales were identified, however, none are inside the construction site. Construction of the new LRCFS at the proposed site would have direct, positive impacts on recreational use of the site and the local economy and income. On the basis of an analysis of the proposed design of the LRCFS, groundwater is not expected to be affected by the construction of the facility. Under the no-action alternative, the new facility would not be built. On the basis of the findings of this EA, the preferred alternative of constructing and operating LRCFS at the proposed site is not expected to result in significant negative impacts to any natural, cultural, physical, or socioeconomic resource, and is preferred over the no-action alternative.

Table ES–1. Summary of Potential Effects of Preferred Alternative and No-Action Alternative NASA MSFC Environmental Assessment.

Resource	Preferred Alternative	No-Action Alternative
Land Use	Existing land use designations of sites would not change. The LRCFS would make the land use of the site more representative of its existing surroundings.	No effect because the new facility would not be constructed.
Air Quality	Based on the conducted analysis, no significant impact to air quality. Estimated emissions of ozone precursors and particulate matter meet *de minimis* requirements. The heating and air conditioning systems will be cleaner and energy efficient, resulting in less affect to air quality.	No effect because the new facility would not be constructed.
Noise	Short-term increase in noise levels during construction. Based on the EPA estimates of noise dissipation, noise levels during construction would be within or below the residential acceptable range in nearest residential communities. Noise levels generated during operation of the new facilities would be below the residential acceptable range in these communities.	No effect because the new facility would not be constructed.
Topography, geology, and soils	Minor impacts on existing topography and soils during site clearing and grading. Erosion controls would be implemented during construction. No impacts would occur during operation of the facility.	No effect because the new facility would not be constructed
Surface water	Potential minimal impact due to storm water management. No surface waters located at proposed construction site.	No effect because the new facility would not be constructed
Groundwater	No groundwater would be removed during construction; therefore, there is no anticipated impact to groundwater.	No effect because the new facility would not be constructed
Vegetation	Minor impacts to vegetation are anticipated. The majority of the 50-acre site had been clear-cut prior to purchase, but a minimum number of trees may be removed to put in the access drives.	No effect because the new facility would not be constructed
Wetlands	No impacts during construction or operation of the facility because there are no wetlands at the construction site. Wetlands located on the 50-acre property will not be disturbed.	No effect because the new facility would not be constructed
Wildlife	No significant impacts because site does not provide much habitat. Common urbanized wildlife may be temporarily disturbed. Post construction environment will provide a similar or improved habitat for wildlife.	No effect because the new facility would not be constructed
Protected species and habitats	Minor impacts to protected species could be anticipated. Eight protected species were identified in DeKalb County and a potential habitat for four of the species was identified. None of the potential habitat sties are in the vicinity of the construction site.	No effect because the new facility would not be constructed.

Table ES–1. Summary of Potential Effects of Preferred Alternative and No-Action Alternative NASA MSFC Environmental Assessment (continued).

Resource	Preferred Alternative	No-Action Alternative
Cultural resources	Minor impacts to cultural resources could be expected. No structures exist on the property, but six cultural resources locales have been identified during surveys. Construction of the facility would not be located within any of the locales identified.	No effect because the new facility would not be constructed.
Demographics	No impact because there would be no net increase or decrease in personnel.	No effect because the new facility would not be constructed.
Regional employment and economic activity	Short-term, temporary increase in economic activity resulting from construction and construction-related activities. Potential for economic growth in the area after construction due to tourism.	No effect because the new facility would not be constructed
Income	Positive minimal impact during construction. Once operational, there would be no net increase or decrease in personnel.	No effect because the new facility would not be constructed
Housing	No impact because there would be no net increase or decrease in personnel.	No effect because the new facility would not be constructed
Schools	No impact due to construction because there would be no net increase or decrease in personnel. Once operational, there would be a positive impact to educational opportunities offered to area schools.	No effect because the new facility would not be constructed
Medical facilities	There is potential for temporary minimal impact to medical facilities during construction and a chance for minimal impact during operation due to an increase in potential of accident and/or illness by visitors.	No effect because the new facility would not be constructed
Fire protection	Minimal impact during construction and operations because of the additional new building.	No effect because the new facility would not be constructed
Recreation	A positive impact to recreation due to operation of this facility can be anticipated.	No effect because the new facility would not be constructed.
Protection of children	Construction or operation of the facility would not result in significant impacts to noise, air quality, groundwater, surface water, or hazardous/toxic materials and wastes that would negatively affect children.	No effect because the new facility would not be constructed.
Utilities	Minor impacts to potable water and waste water usage during operation of the new facility due to the anticipated number of visitors. A minimal impact to solid waste collection can be anticipated. The energy-efficient building design will result in positive impacts during operation.	No effect because the new facility would not be constructed.
Transportation	Minimal temporary increase in traffic during construction. Potential increase in traffic during operations would result in minimal impacts.	No effect because the new facility would not be constructed.

1. Purpose of and Need for the Proposed Action

Jacksonville State University's (JSU's) Environmental Policy and Information Center (EPIC), proposes to build an educational facility in DeKalb County, Alabama called The Little River Canyon Field School (LRCFS). Congress, under FY 2003 Appropriations Bill for the Department of Veteran Affairs, Housing and Urban Development and Independent Agencies, UNITED STATES PUBLIC LAWS 108th Congress - First Session Convening January 7, 2003 PL 108-7 (HJRes 2) CONSOLIDATED APPROPRIATIONS RESOLUTION, 2003 appropriated funding for this project through a National Aeronautics and Space Administration (NASA) Facility Grant.

NASA, specifically, Marshall Space Flight Center (MSFC) will be involved in reviewing and/or approving any environmental studies performed by JSU.

NASA is required to analyze the environmental consequences of this action under the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States (U.S.) Code (U.S.C.) 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) Parts 1500 through 1508), and NASA regulations (14 CFR Part 1216 Subpart 1216.3). This Environmental Assessment (EA) has been prepared in accordance with these regulatory requirements and is consistent with NASA Procedural Requirements (NPR 8580.1) for implementing NEPA.

1.1 Purpose of the Proposed Action

The purpose of the proposed action is to construct a new educational facility called The LRCFS in DeKalb County, Alabama. The school would be a project of JSU's EPIC, designed to provide affordable and accessible educational opportunities throughout Northeast Alabama.

1.2 Need for the Proposed Action

The LRCFS will provide a wide range of programs primarily related to Earth sciences and the environment. JSU's commitment to providing affordable and accessible educational opportunities and the continued success of programs conducted in or around the Little River Canyon National Preserve and DeSoto State Park have led to the need for a dedicated facility to support education related to NASA's Earth Science Enterprise. The facility would include a reception/orientation area, permanent displays, a changing exhibit gallery, an audio/visual (A/V) miniauditorium, laboratories, conference and meeting areas, office space, and community conference multiuse space.

1.3 Decisions to Be Made

The primary decision to be made by NASA, supported by the information presented in this EA, is whether or not to fund construction of the specified new facility, LRCFS, in DeKalb County.

"FY 2003 Appropriations Bill for the Department of Veteran Affairs, Housing and Urban Development and Independent Agencies". The complete site is "UNITED STATES PUBLIC LAWS 108th Congress - First Session Convening January 7, 2003 PL 108-7 (HJRes 2) CONSOLIDATED APPROPRIATIONS RESOLUTION, 2003."

1.4 Issues Considered but Eliminated from Further Analysis

NASA used a systematic and interdisciplinary approach to ensure that all resources were analyzed and potential issues were identified. Table 1 identifies issues that were determined to have no impact and were eliminated from further consideration.

Table 1. Issues considered but eliminated from further analysis.

Element	Rationale
Environmental justice	No impact: This proposal would not result in unequal justice or unequal protection of any part of DeKalb County. All parts of the community that have potential to be affected by this proposal have had an opportunity to make comments.
Waste, hazardous or solid	No impact from hazardous waste: No chemicals or hazardous wastes would be stored, produced, transported, or disposed of as a result of the proposed action. Additionally, no extremely hazardous substances as defined at 40 CFR 355 would be used for the proposed action. No impact from solid waste: Builders will use the pack it in, pack it out policy; therefore, there will be no appreciable impact from solid waste generated as a result of the proposed action.
Flood plains	While flood plain areas exist within the 50-acre site, no portion of the proposed construction site for the new LRCFS is located within the 100-yr flood plain. As a result, construction of the new LRCFS will not affect flood plains.
Asbestos, lead-based paint, and polychlorinated biphenyls (PCBs)	No impact: This proposal is for new construction and therefore would not have asbestos, lead-based paint, or PCB issues.

2. Description of the Proposed Action and Alternatives

This section describes the proposed action and alternatives to the proposed action. NEPA requires consideration of reasonable alternatives to the proposed action, including the no-action alternative of maintaining existing conditions. The alternatives analysis that was conducted for the proposed action evaluated potential construction site, for the new LRCFS facility, and maintaining existing conditions.

2.1 Description of the Proposed Action

The proposed action is to construct a new facility, LRCFS located on a 50-acre site in DeKalb County, AL. (fig. 1).

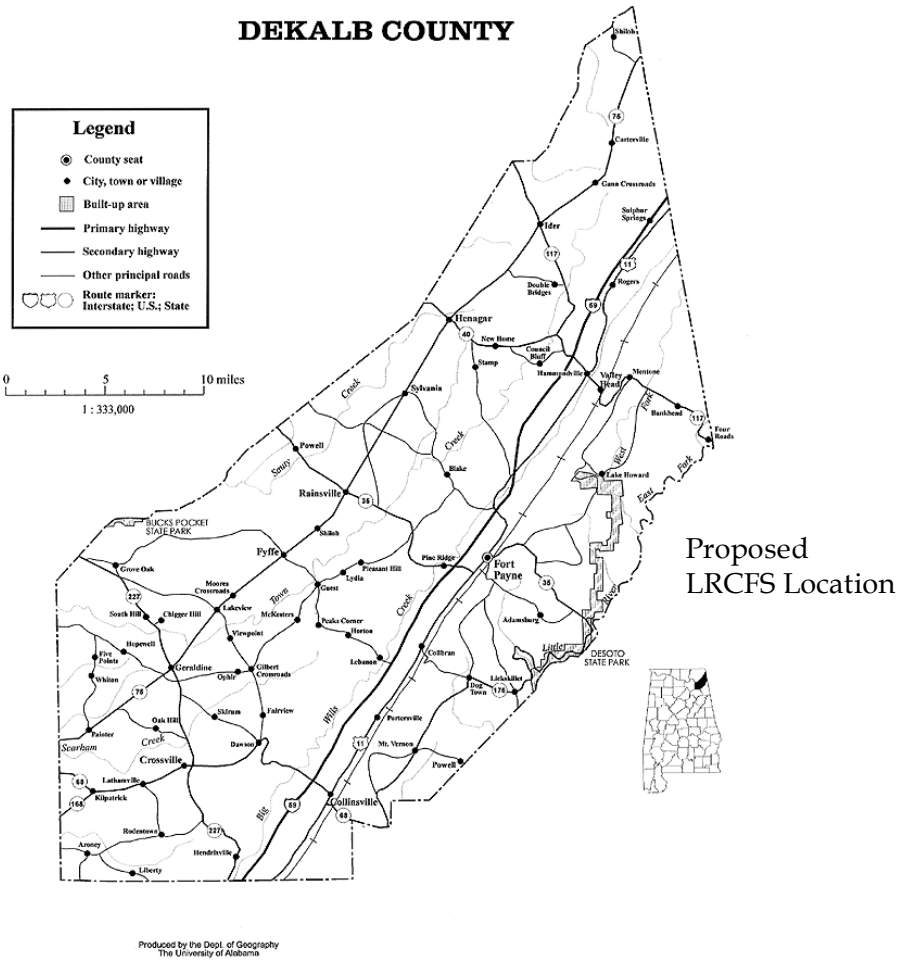


Figure 1. Proposed location of LRCFS in DeKalb County, Alabama.

JSU's commitment to providing affordable and accessible educational opportunities has resulted in many programs and opportunities in or around the Little River Canyon National Preserve and DeSoto State Park. Each program varies in terms of length and degree of difficulty. However, interdisciplinary educational topics proposed to be covered at the new LRCFS include: Interpretive hikes, archaeology, rocks and soils, water quality, coal, fossils and fuel, watersheds, electricity, compass or Global Positioning System (GPS) course, nature art, canyon creatures, Native American storytelling, or critter tales.

The building is proposed to be constructed on the western side of the 50-acre site located along Highway 35. Figure 2 shows the proposed location of the building in reference to the 50-acre site.

The LRCFS will house displays and visitor information on the cultural and natural resources of the Little River Canyon area, meeting rooms, an auditorium and offices for JSU's field school staff and for the Little River Canyon National Park staff.

2.2 Alternatives to the Proposed Action

2.2.1 No-Action Alternative

The no-action alternative is to maintain existing conditions, i.e., not to construct the new LRCFS, nor renovate or improve existing property. The no-action alternative is analyzed in section 4 as a baseline against which the proposed action can be compared.

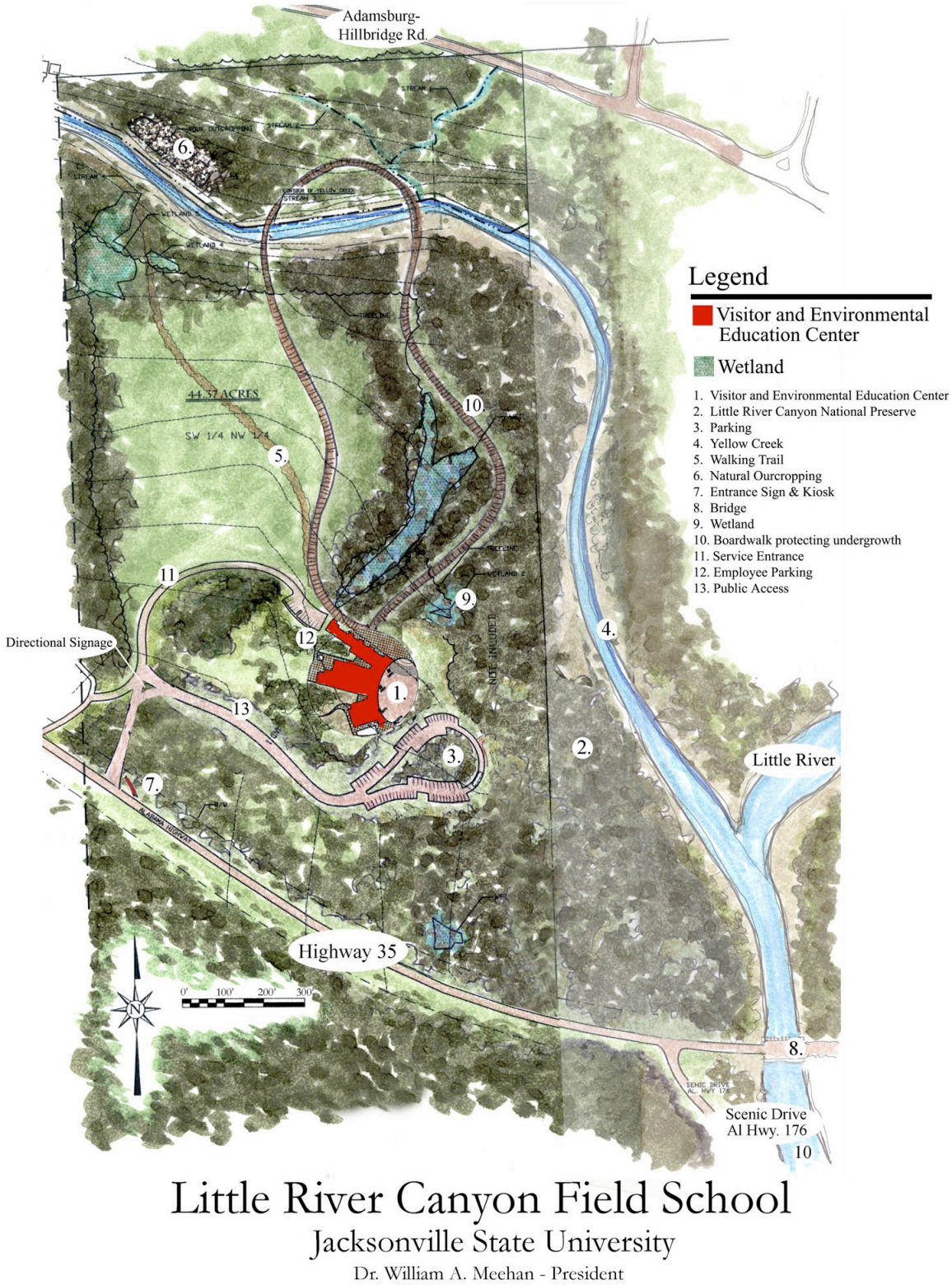


Figure 2. Proposed location of the LRCFS building in reference to the 50-acre site.

3. Affected Environment

3.1 Project Location

The LRCFS project area is located in Central DeKalb County, Alabama, on approximately 50 acres. The site is located on the north side of Alabama Highway 35 and Alabama Highway 176 (Canyon Rim Drive). The site is bounded to the north by Adamsburg-Hillbridge Road and existing LRCFS property forms the eastern boundary. The western boundary is joined by private property. Access to the site is provided by a dirt road located at the southwestern corner and from Adamsburg-Hillbridge Road. Figure 3 shows the approximate location of the LRCFS site in reference to the surrounding area.

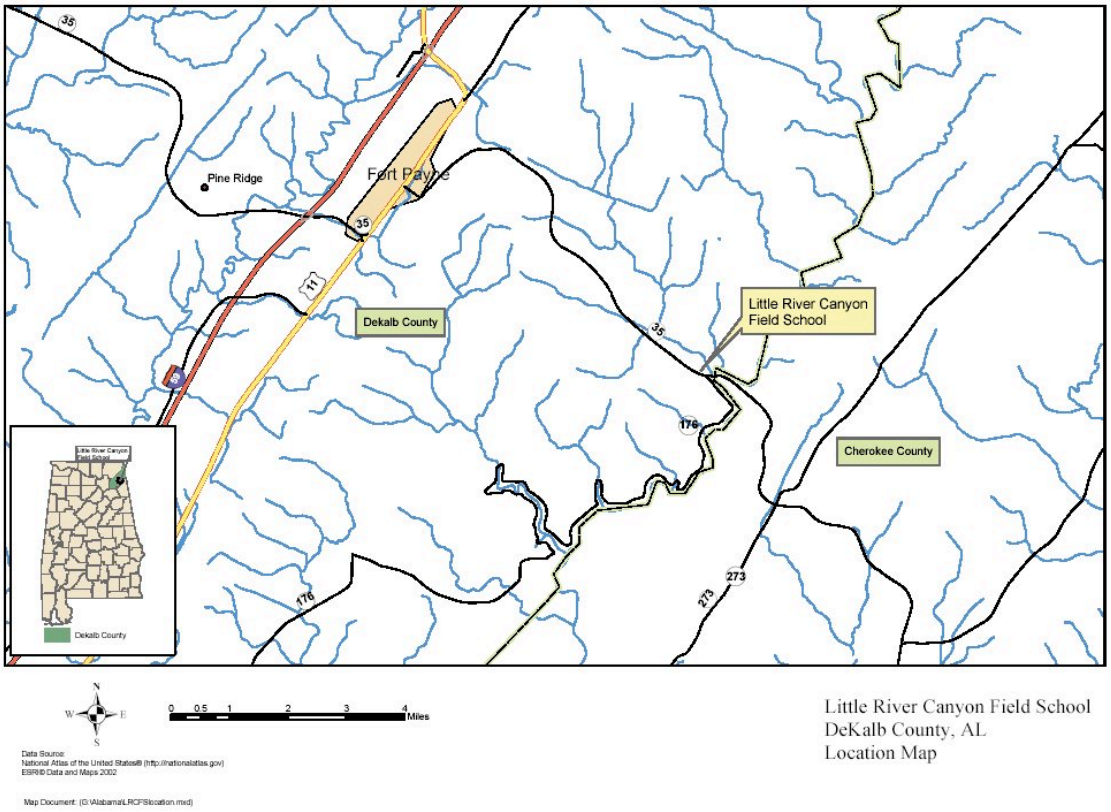


Figure 3. LRCFS location.

The majority of the site was clear-cut approximately three years ago, before being purchased by JSU. A wooded buffer was left along both sides of Yellow Creek, the major drainage feature on the site. An uncut strip of oak-pine uplands was also left along the frontage adjacent to Highway 35.

The LRCFS building, access drives, and parking area will comprise a maximum of 2–3 acres within the 50-acre site.

3.2 Land Use

The site proposed for building the LRCFS is located on 50 acres that lie to the west of the Little River Canyon Preserve. The land was acquired by JSU from Alabama Power Company in two separate transactions. The first 10-acre parcel closest to the boarders of the Little River Canyon Preserve was donated to JSU in February 1997 with an agreement that the land would be left in its natural state. The second adjoining 40-acre parcel was purchased from the Alabama Power Company in October, 2003 and had been clear cut by the power company after an ice storm, before being purchased by JSU. There are no structures on the land and before being purchased by JSU, the land was not used.

3.3 Air Quality

This subsection describes the air quality environment, with particular attention paid to background ambient air quality compared to the primary National Ambient Air Quality Standards (NAAQS) and the attainment status of DeKalb County. The predicted emissions from the construction of the new facilities can be compared to the baseline ambient air quality conditions to assess the potential effects of the proposed action on human health and the environment.

Air quality is regulated by the federal government under Title 40 CFR 50 (NAAQS); Title 40 CFR 51 (Implementation Plans), Title 40 CFR 61 and 63 (National Emission Standards for Hazardous Air Pollutants (NESHAPs)), Title 40 CFR 40 (Operating Permits), and Title 40 CFR 82 (Protection of Stratospheric Ozone(O_3)).

3.3.1 Air Quality Standards

Federal standards have been established for six principal pollutants by the U.S. Environmental Protection Agency (EPA), termed the NAAQS (table 2). There are two types of NAAQS—primary standards and secondary standards. Primary standards establish limits to protect public health and secondary standards establish limits to protect public welfare. These standards establish maximum concentrations for the following seven principal pollutants, often referred to as criteria pollutants:

- O_3
- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Sulfur dioxide (SO_2)
- Particulate matter (PM) with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) and less than 10 microns (PM_{10})
- Lead (Pb)

The Alabama Department of Environmental Management (ADEM) has adopted the NAAQS to regulate pollutant levels.

Table 2. National ambient air quality standards.

Pollutant	National Standards [a] Primary [b, c]	Secondary [b, c]
CO		
8-hr average	10 mg/m^3 (9 ppm)	None
1-hr average	40 mg/m^3 (35 ppm)	None
NO2		
Annual arithmetic mean	100 µg/m^3 (0.053 ppm)	Same a primary standard
O_3		
8-hr average	0.08 ppm (157 µg/m^3)	Same as primary standard
1-hr average	0.12 ppm (235 µg/m^3)	Same as primary standard
Pb		
Quarterly average	1.5 µg/m^3	Same as primary standard
PM_{10}		
Annual arithmetic mean	50 µg/m^3	Same as primary standard
24-hr average	150 µg/m^3	Same as primary standard
$PM_{2.5}$ e		
Annual arithmetic mean	15 µg/m^3	Same as primary standard
24-hr average	65 µg/m^3	Same as primary standard
SO_2		
Annual arithmetic mean	80 µg/m^3 (0.03 ppm)	None
24-hr average	365 µg/m^3 (0.14 ppm)	None
3-hr average	None	13005 µg/m^3 (0.50 ppm)

Notes:

a. National standards other than O_3 and those based on annual arithmetic means are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year, with maximum hourly average concentrations above the standards, is equal to or less than one.

b. Concentration expressed first in units in which it was promulgated, and equivalent units are given in parentheses. The equivalent units are based on a reference temperature of 25 ˚C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25 ˚C and a reference pressure of 760 mm of mercury (1,013.2 millibars).

c. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

d. National Secondary Standards: The levels of air quality necessary with an adequate margin of safety to protect the public welfare from any known or anticipated adverse effects of pollutant.

e. Changes in NAAQS issued in 1997 were overturned in May 1999 by the U.S. Court of Appeals for the D.C. Circuit.

ppm = Parts per million

µg/m^3 = Micrograms per cubic meter

mg/m^3 = Milligrams per cubic meter

PM_{10} = Particulate matter equal to or less than 10 microns in diameter

$PM_{2.5}$ = Particulate matter equal to or less than 2.5 microns in diameter

Source: Title 40 CFR 50

3.3.2 Regional Air Quality

Existing air quality is defined as either in attainment or nonattainment with respect to ambient air quality standards. An area with air quality better than the NAAQS is designated as being in attainment, whereas an area in which pollutant concentrations exceed the NAAQS with a frequency specified by the regulation is classified as nonattainment.

In Alabama, air quality is assessed at the county level. The proposed site for the LRCFS is located within DeKalb County, which is currently designated by EPA to be in attainment for all criteria pollutants.

3.3.3 Air Emissions

Emission inventory information for the affected environment was obtained from EPA's National Emission Inventory (NEI) database to describe the baseline conditions in the area. NEI is an emissions database developed by EPA. It is based partially on emission data obtained from State and local agencies, but it is not a database of official State emissions data.

The most recent emission inventories for Dekalb County are listed in table 3.

Table 3. DeKalb County emissions inventories.

Total emissions	VOC	NH_3	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$
DeKalb County total emissions (tons/yr)	8,110	5,223	3,690	36,967	691	9,563	2,581

Notes:
VOC = Volatile organic compounds
NOx = Nitrogen oxides
CO = Carbon monoxide
SO_2 = Sulfur dioxide
PM_{10} = Particulate matter equal to or less than 10 microns in diameter
Source: 1999 NEI

3.4 Noise

Noise levels in the environment are usually expressed in terms of hourly equivalent sound pressure levels (L_{eq}) in decibels on the A-weighted scale (dBA). When expressed in this manner, noise levels approximate the response of the human ear by filtering out some of the noise in the low- and high-frequency ranges that the ear does not easily detect. The A-weighted scale is also used in most local ordinances and standards. L_{eq} is defined as the average noise level, on an energy basis, for a specific period of time (e.g., hourly).

Existing noise levels at the proposed construction site for the new facility were estimated using a number of reports prepared by EPA on general noise conditions in the United States. A summary report, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (EPA, 1974), indicated that national noise level trends could be used to represent regional noise conditions on a broad basis. Individual discrepancies may occur, especially in areas with a high concentration of specialized land uses such as heavy industrial or government/institutional, but the noise levels generally are consistent within a specific land use area across the country. Figure 4, taken from this report, shows that existing noise levels for a small town or wooded area would typically be 50 decibels.

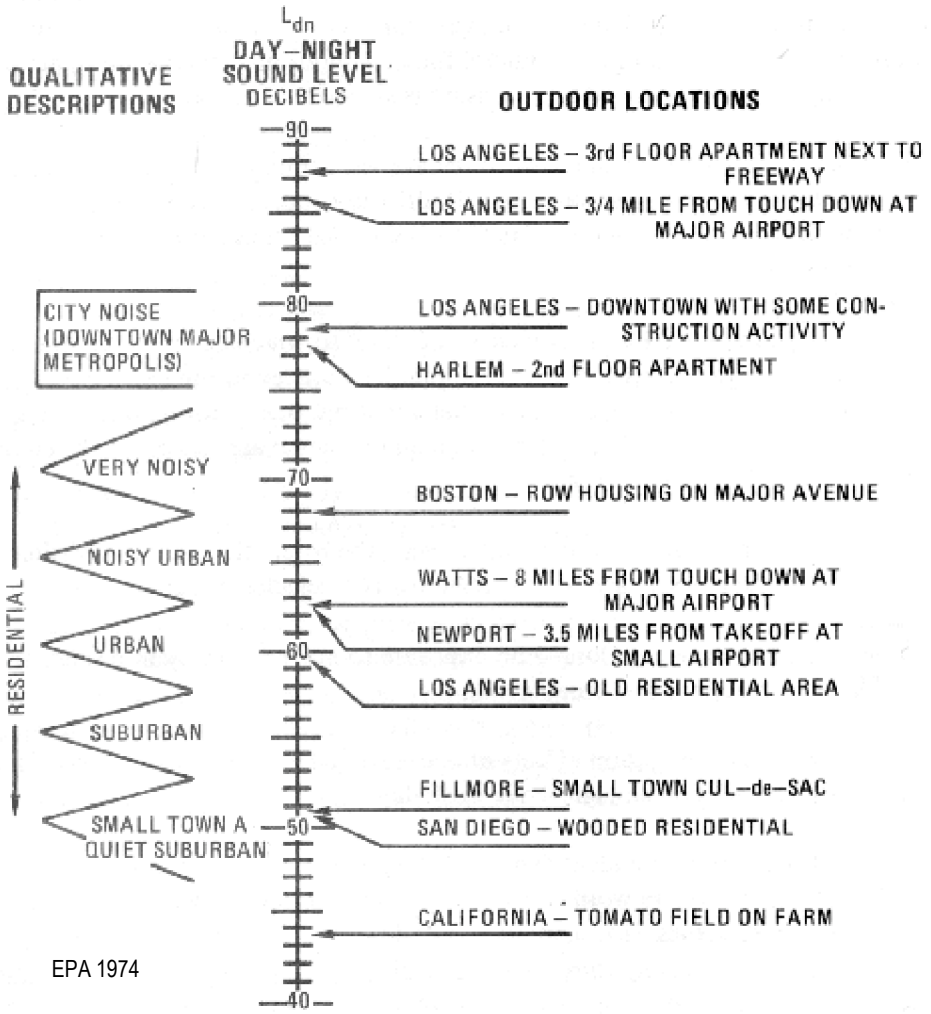


Figure 4. Outdoor day-night sound level in dB (re 20 micropascals) at various locations.

On the basis of data presented in EPA's "Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances," PB 206717 (EPA, 1971), outdoor construction noise levels range from 78 dBA to 89 dBA, approximately 50 ft from a typical construction site. Table 4 presents the typical noise levels (dBA at 50 ft) estimated by EPA for the main phases of outdoor construction.

Table 4. Typical noise levels for outdoor construction.

Construction Phase	Noise Level (dBA Leq at 50 ft from source)
Ground clearing	84
Excavation, grading	89
Foundations	78
Structural	85
Finishing	89

The proposed construction site for the new LRCFS is approximately one-half mi from the nearest residential area, which is a single dwelling home in the county.

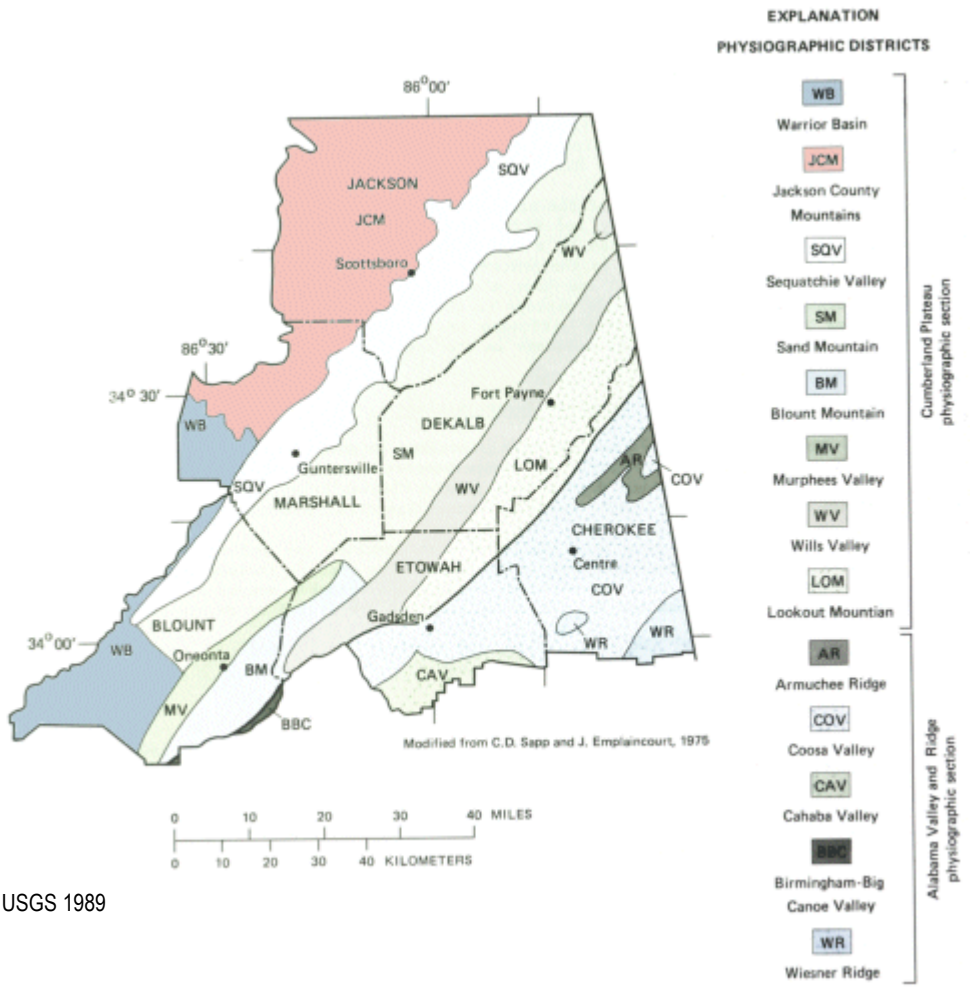
3.5 Topography, Geology, and Soils

3.5.1 Topography

The rolling terrain and flat areas of DeKalb County rise to approximately 1,800 ft above sea level in the northeast and slopes southwest down to about 750 ft above sea level. Elevations on the 50-acre site range from approximately 1,190 ft above sea level along the stream bottoms, to more than 1,300 ft above sea level along the major ridgelines, with the proposed construction site at an approximate elevation of about 1,280 ft above sea level. Average land slopes in the area are considered to be the steepest in the State, exceeding 40 percent. Land slopes on the 50-acre site average 10 percent or less except along the banks of Yellow Creek, where slopes exceed 60 percent. Stream slopes average from 400 ft/mi, with most of the variation in elevation associated with drainage slopes towards the Little River.

3.5.2 Geology

The proposed site for the LRCFS is located in the Appalachian Plateau, also known as the Cumberland Plateau, within the Lookout Mountain physiographic district of southeastern DeKalb County. As shown in figure 5, Lookout Mountain is a submaturely dissected synclinal plateau and rises 400–750 ft above the Big Wills Valley district. The geology of the Lookout Mountain area, illustrated in figure 6, is mapped as a synclinal structure of the Pennsylvanian Pottsville Formation consisting of light-gray thin- to thick-bedded quartzose sandstone and conglomerate containing interbedded dark-gray shale, siltstone, and coal (Szabo and others, 1988). The formation may be as much as 800-ft thick on Lookout Mountain.



USGS 1989

Figure 5. Physiographic districts of North Alabama.

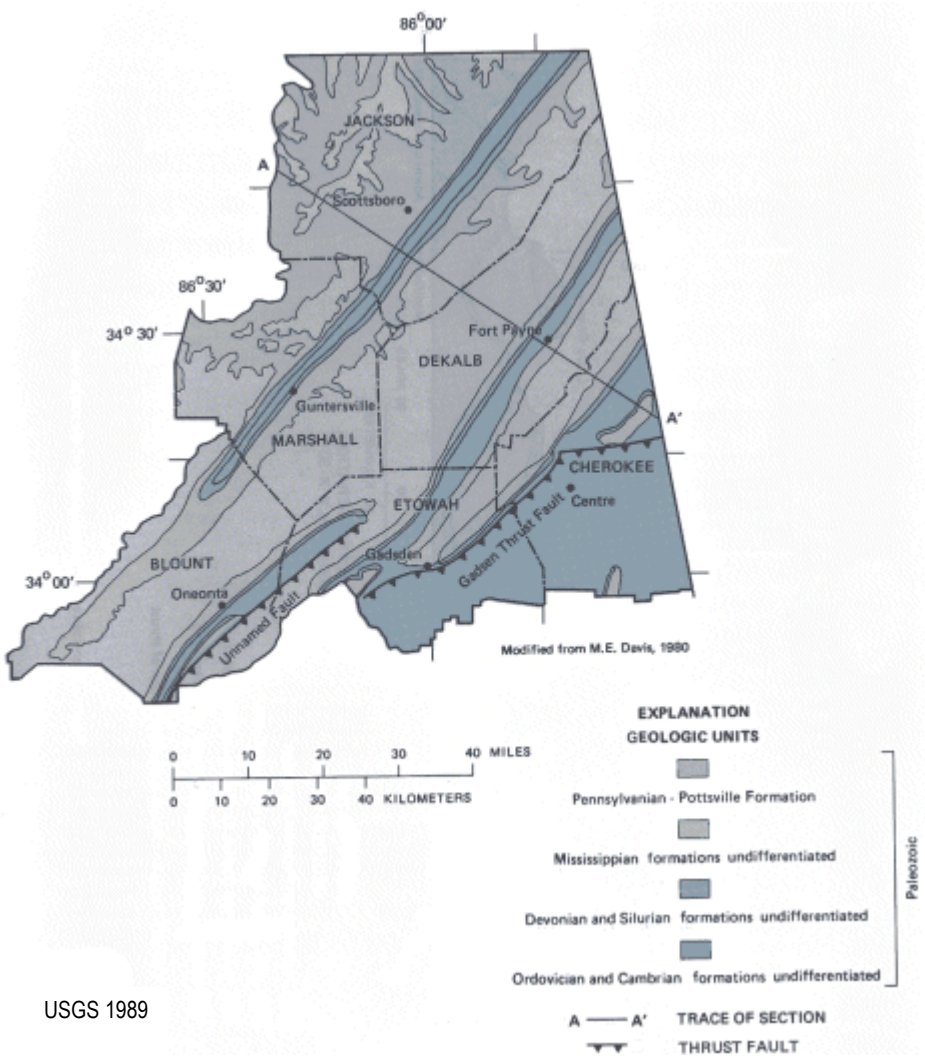


Figure 6. Generalized geology of North Alabama.

3.5.3 Soils

As shown in figure 7, soils occurring within the DeKalb County area are classified as Appalachian Plateau and Limestone Valley and Uplands soil categories. However, soils occurring in the area proposed for the LRCFS are of the Appalachian Plateau. The more level areas of the Appalachian Plateau are dominated by Nauvoo, Hartsells, and Wynnville soils formed in the residuum from sandstone (Swenson et al. 1958). They have loamy subsoils and fine sandy loam surface layers. The more rugged portions of the Appalachian Plateau are dominated by soils such as Montevallo and Townley, which were formed in residuum from shale. These soils have either a very channery loamy or clayey subsoil with silt loam surface layers.

The proposed LRCFS site is mostly covered by soils of the Hartsells series. These soils are moderately deep, well-drained, moderately permeable, that form in moderately course to medium textured materials. The country rock consists of acid hard sandstone containing thin strata of shale or siltstone in some places. Hartsells soils are typically associated with broad, smooth plateaus, level to moderately steep ridges and upper slopes of hills and mountains. Slopes between 3 and 8 percent are dominant but the extreme range of slope is 2–25 percent. (JSU 2004)

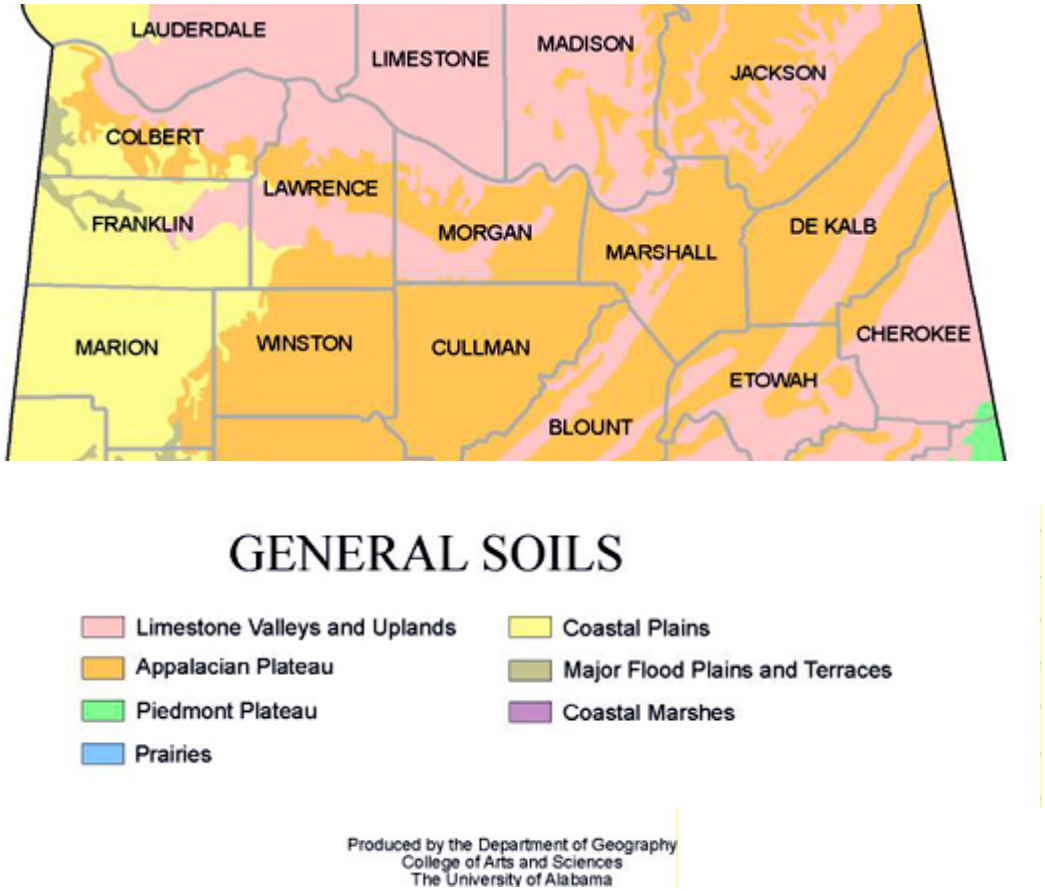


Figure 7. General soils of Northern Alabama.

3.6 Water Resources

3.6.1 Surface Water

A river basin consists of the entire geographic area (hillside, valley, and plain) from which water flows into the primary river. Rain falling within a river basin, or watershed, will run downhill until it reaches a stream. Small streams join other streams and eventually flow into a river and eventually that river flows into the sea. Large rivers are made up of an intricate network of smaller rivers and streams. Rivers not only provide habitat for fish, aquatic invertebrates, amphibians, and terrestrial fauna, but they are used for recreation, water supplies for communities, irrigation for agriculture, and transportation. As shown in figure 8, DeKalb County is part of the Tennessee River and the Coosa River drainage basins. However, the site proposed for the LRCFS lies within the boundaries of the Upper Coosa River drainage basin, which is a subbasin of the Coosa River basin. A total of 16 subwatersheds, listed in table 5 and shown in figure 8, further define the Upper Coosa River Basin. In addition, numerous perennial and intermittent streams discharge to the Upper Coosa River. (A perennial stream is a stream that flows throughout the year, except during extreme drought and an intermittent stream flows at least 6 months out of the year, but doesn't flow during part or all of the summer.) At its closest point, the proposed LRCFS site is located about 1,200 ft from Yellow Creek, one of the streams described below. (ADEM 2004)

Table 5. Subwatersheds of the Upper Coosa River basin.

	Upper Coosa Subwatersheds		
Subwatershed Number	**Subwatershed Name**	**Size (mi^2)**	**Size (acres)**
03150105–030	Upper Chattooga River	6.48	4,147.2
03150105–050	Mills Creek	46.26	29,606.4
03150105–060	Lower Chattooga River	33.96	21,734.4
03150105–080	West Fork of the Little River	28.99	18,553.6
03150105–100	East Fork of the Little River	29.22	18,700.8
03150105–110	Bear Creek	79.70	51,008
03150105–120	Little River	22.38	14,323.2
03150105–130	Spring Creek-1	40.94	26,201.6
03150105–140	Yellow Creek	86.15	55,136
03150105–180	Coosa River-1	59.87	38,316.8
03150105–200	Spring Creek-2	107.46	68,768
03150105–220	Upper Terrapin Creek	165.25	105,760
03150105–240	Hurricane Creek	55.91	35,782.4
03150105–250	Lower Terrapin Creek	54.07	34,604.8
03150105–260	Sugar Creek	17.14	10,969.6
03150105–270	Coosa River-2	18.18	11,635.2

Note: USDA 1985.

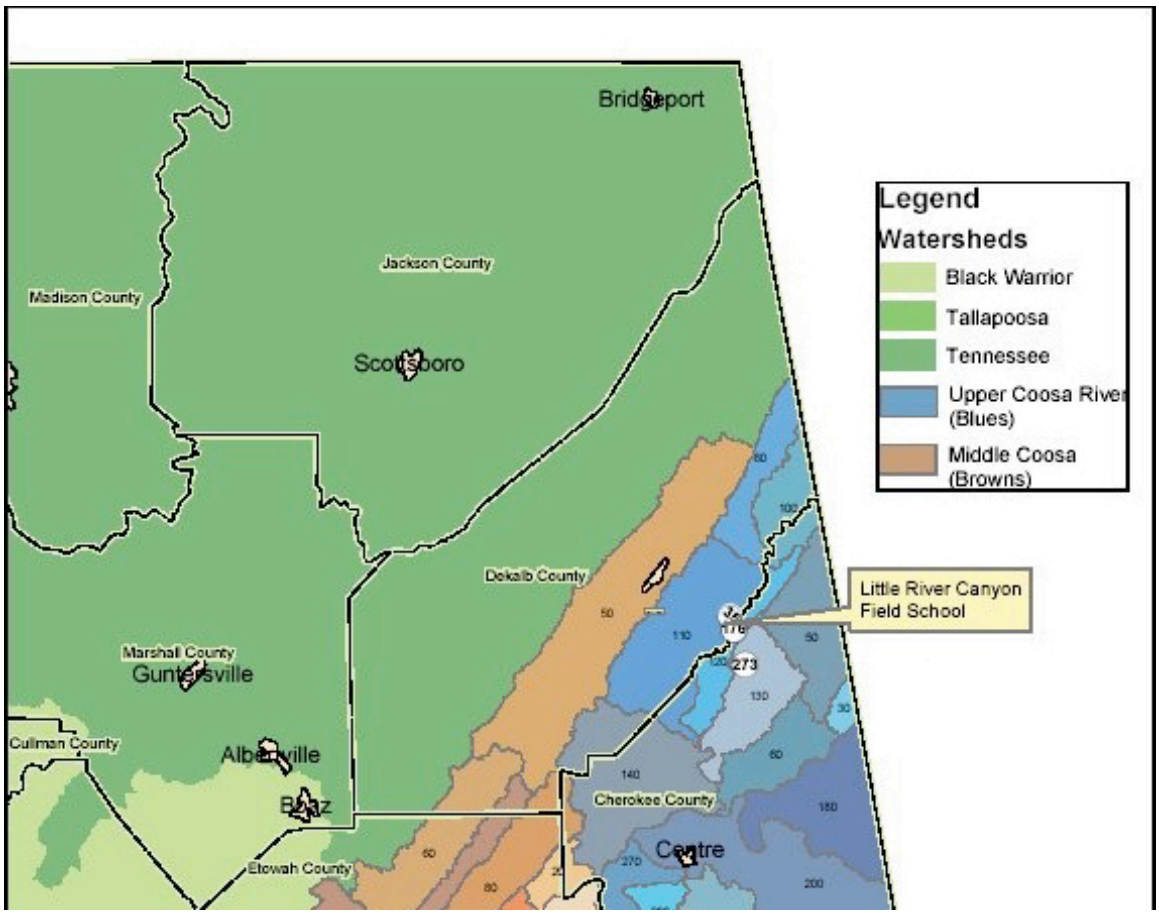


Figure 8. Water basins of North Alabama.

There are four streams running through the 50-acre LRCFS site that direct storm water flow. Most of the surface drainage is directed toward the east and then to the south. The construction site is located 80–90 ft above (in elevation) any of the four streams. Photos of all four streams are included in appendix A: Wetland Delineation and Protected Species Survey.

Stream 1 is a perennial stream that begins at a culvert under Adamsburg-Hillbridge Road. The stream does not extend above the road. The upper end of the stream is disturbed due to timbering of the property and run-off from the road. The upper end of the creek is 2–3-ft wide; however, once it reaches the wood line along Yellow Creek, it becomes a bedrock stream with an average width of 3–5 ft. The stream flows directly into Yellow Creek.

Stream 2 is an intermittent tributary of stream 1. The channel has an average width of 1–3 ft and the substrate is sand and gravel. The upper end of the drainage has a very dense growth of Chinese privet, an invasive exotic.

Stream 3 is Yellow Creek. Yellow Creek is a perennial stream with an average width of 25–30 ft. After leaving the site, the creek joins Little River, just above Little River Falls. The creek has a substrate of gravel, cobble, boulders, and bedrock.

Stream 4 is a small, 1-ft wide, intermittent stream that begins within wetland 4, a nonjurisdictional wetland located in the central portion of the site. This wetland is described in appendix A. The stream has a substrate of sand and gravel. As the stream nears Yellow Creek, it goes over a small ledge and turns into a subterranean system.

There are no surface water features within the proposed building site for the new LRCFS.

3.6.2 Groundwater

The hydrogeology in DeKalb County is differentiated into four principal units: Pennsylvanian-Pottsville Formation, and the undifferentiated Mississippian, Devonian and Silurian, and Ordovician and Cambrian formations. As shown in figure 6, an explanation of the geologic units of DeKalb County, the area proposed for building the LRCFS lies within the Pennsylvanian-Pottsville Formation.

The only aquifer in the vicinity of the proposed LRCFS area is the Pottsville aquifer. The formation ranges from 300–800 ft in thickness and outcrops extensively on synclinal mountain tops, or mountain tops that slope downwards in opposite directions, so as to meet, such as Lookout Mountain. Rocks in the aquifer consist of tightly cemented interbeds of quartose, sandstone, shale, siltstone, conglomerate, limestone, and clay, with little porosity and permeability. Groundwater in the Pottsville aquifer generally moves very slowly because it must travel through the pore spaces of rock and soil. Movement is primarily controlled by gravity and, in general, is from topographical highs to topographical lows where it is discharged to streams, such as the Little and Coosa Rivers, which are the major groundwater drains for this area. (U.S. Geological Survey (USGS) 1989)

Groundwater is naturally replenished (recharged) through precipitation. Annual recharge to the Pottsville aquifer is estimated to be about 2–3 in. A large part of this recharge is naturally discharged to streams. However, many streams that drain the Pottsville aquifer are intermittent and indicate that drain discharge from the Pottsville aquifer often cannot sustain streamflow through extended rainless periods. Groundwater discharge from the Pottsville aquifer is approximately 2 in annually. Additional discharge occurs as withdrawals from wells, both domestic and public water supplies. The Pottsville aquifer is widely used as a source for public water supply in the area. (USGS 1989)

Whenever recharge occurs, aquifers are susceptible to contamination. Potential sources of contamination are from construction debris, leaks and spills from equipment during the construction phase of the project, and from spills and leaks from parked vehicles once the facility is operational.

3.7 Biological Resources

3.7.1 Vegetation

The majority of the proposed LRCFS site was clear cut after an ice storm, approximately 3 years ago. A wooded buffer was left along both sides of Yellow Creek, the primary drainage feature of this site. An uncut strip of oakpine uplands was also left along the frontage, adjacent to Highway 35.

Clearcut Areas

Vegetation within the cutover area is typical of early successional environments. Succession is the gradual replacement of one plant community by another. In a forested ecosystem, tree cover can be temporarily displaced by natural or human disturbance (e.g., flooding by beaver, or logging). The open environments created by removal of tree cover often support very different plant species than a full-canopied forest. These open environments are generally referred to as early-successional environments because as time passes, trees will return. Thus, the open conditions occur early in the sequence of plant communities that follow disturbance.

Species observed include Canada goldenrod (*Solidago Canadensis*), Chinese privet (*Ligustrum sinense*), serrate leaf blackberry (*Rubus argutus*), white greenbrier (*Smilax glauca*), dong fennel (*Eupatorium capillifolium*), broom-sedge (*Andropogon virgincus*), and panic grass (*Dichanthelium dichotomum*).

Upland Buffer: Yellow Creek

Both the south and north side of Yellow Creek have a narrow wooded buffer. This buffer has sporadic outcroppings of sandstone. This relatively dry vegetation community is dominated by deerberry (*Vaccinum stamineum*), scrub pine (*Pinus virginiana*), eastern red cedar (*Juniperus virginiana*), yellow jessimine (*Gelsemium sempervirens*) hickory species (*Carya sp.*), and sweet-gum (*Liquidambar styraciflua*).

Slope and Floodplain: Yellow Creek

The southern slope along Yellow Creek is very steep. It is dominated by mountain laurel (*Kalmia latifolia*), red maple (*Acer rubrum*), rosebay rhododendron (*Rhododendron catawbiense*), shuttleworth ginger (*Hexastylis shuttleworthii*), smooth rhododendron (*Rhododendron arborescens*), and galax (*Galax urceolata*). The mountain laurel and rosebay rhododendron form a dense understory.

The majority of the northern slope along Yellow Creek is much flatter with some typical floodplain habitat. The dominant species on this side of the creek is American Holly (*Ilex opaca*). Other species include mountain laurel, galax, rosebay, rhododendron, and loblolly pine (*Pinus taeda*).

Vegetation living on or adjacent to the banks along Yellow Creek include tag elder (*Alnus serrulata*), smooth rhododendron, yellow root (*Xanthorhiza simplicissima*), and Virginia-willow (*Itea virginca*). A few specimens of golden club (*Orontium aquaticum*) were observed within Yellow Creek.

3.7.2 Wetlands

Wetlands within LRCFS are either scrub-shrub forested or scrub-shrub emergent systems. On the basis of a December 2003 field study, there are a total of two jurisdictional wetlands, three isolated, non- jurisdictional wetlands, and four jurisdictional streams on the proposed LRCFS site. The results of this study are attached as appendix B. The jurisdictional wetlands have been subdivided by wetland class as follows:

- Forested/scrub-shrub.
- Emergent/scrub-shrub.

The largest jurisdictional wetland on the proposed LRCFS property is the forested and scrub-shrub system, comprised of 0.76 acres along the southeastern portion of the site. Trees dominate the lower end of the wetland whereas the upper end of the system tends to have a scrub-shrub community. The wetland continues outside the study area. Surface saturation is present throughout the wetland. At the extreme end of the wetland, outside the study area, a jurisdictional stream starts. A summary table of vegetation within the wetland is given in appendix B.

The second jurisdictional wetlands within the proposed LRCFS site property are the emergent and scrub-shrub system that is located along the northwest property boundary, comprising a total of 0.62 acres of the 13-acre site. The wetland was clear-cut and is dominated by early successional species. A small, wooded portion of the wetland is intact within the buffer of Yellow Creek. Surface saturation is present throughout the wetland.

Two types of nonjurisdictional wetland have been identified at the proposed site. These systems are:

- Scrub-shrub.
- Emergent.

Nonjurisdictional wetlands do not require permitting or coordination with the U.S. Army Corps of Engineers (USACE) before dredge or fill activities.

No wetlands are located within any of the proposed construction sites for the new facilities.

3.7.3 Wildlife

DeKalb County has an abundance of wildlife, including Golden, Cotton, White-footed, and Oldfield mice, the Hispid Cotton Rat, Meadow Vole, Least Shrew, Little Brown Bat, Black bear, Opossum, Raccoon, Striped Skunk, Coyotes, Red and Gray Fox, Bobcats, Woodchucks, Chipmunks, Gray and Fox Squirrels, Beavers, and Eastern Cottontail and Whitetail Deer. Snakes, such as poisonous-rattlers, water moccasins, copperheads and corals, as well as some other nonpoisonous types, such as black snakes can also be found in and around Little River Canyon in DeKalb County. Bird life is also abundant. Bluebirds, cardinals, blue jays, mockingbirds, doves, woodpeckers, hummingbirds, thrush, oriole, owls, hawks, yellow-hammers, and an occasional eagle can all be found in DeKalb County.

Because the proposed site for the LRCFS has been clearcut, the quality of habitat for wildlife in and around the proposed site would be less than that found in other areas of Little River Canyon. The site more commonly provides a habitat that would support urbanized wildlife species adapted to such environments such as common song birds, squirrels, raccoons, and mice.

3.7.4 Protected Species and Habitats

Threatened and Endangered Species

The Endangered Species Act of 1973 (ESA), as amended, requires that all federal agencies and departments seek to conserve threatened and endangered species. Section 7 of the ESA requires that federally funded projects be coordinated with the U.S. Fish & Wildlife Service (USFWS) to ensure that any action authorized is not likely to jeopardize the continued existence of a protected species or to modify its critical habitat.On the basis of an extensive literature search and consultation with the USFWS, Alabama Department of Conservation and Natural Resources (ADCNR), and Alabama Natural Heritage Program (ANHP), DeKalb County provides a habitat for the following federally listed plant and animal species:

- Blue shiner (*Cyprinella caerulea*)–Threatened
- Fine-lined Pocketbook Mussel *(Lampsilis altilis)* -Threatened
- Gray bat (*Myotis grisescens*)–Endangered
- Indiana bat (*Myotis sodalis*)–Endangered
- Eggbert's sunflower (*Helianthus eggertii*)–Threatened
- Green pitcher plant (*Saracenia oreophila*)–Endangered
- Harperella (*Ptilimnium nodosum*)–Endangered
- Kral's water-plantain(*Sagittaria secundifolia*)–Threatened

Potential habitat exists for green pitcher plants, harperella and Kral's water plantain to exist along Yellow Creek, and for the Indiana Bat; however, because most of the proposed site for the new LRCFS facility has been clearcut, it is unlikely that these species would occur.

3.8 Cultural Resources

Federal agencies are required to protect and preserve cultural resources in cooperation with state and local governments under NEPA and the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470, Public Law (P.L.) 95–515).

The area proposed for construction of the LRCFS was purchased by JSU as part of a 50-acre acquisition for the LRCFS research facility in two separate transactions, as described earlier in section 3.2. Before the purchase, the land was largely unoccupied and unused.

The area proposed for building the LRCFS currently contains no standing structures.

JSU conducted a Cultural Resources investigation of the proposed construction site for the LRCFS encompassing just over 44 acres and resulting in six locales. Results of the investigation are given in appendix C: An Archaeological Survey of the Future Location for the LRCFS Research Facility in DeKalb County, Alabama that describes cultural material discovered within the 50-acre site. In addition, a seventh locale was observed and recorded just outside the project area. Of these seven locales, four received official Alabama site numbers and were added to the state database. The remaining locales were not considered to be archeological sites but rather isolated finds, based on such a small number of cultural material recovered from each. Details of the survey conducted are included with this EA as appendix C.

There are no buildings or other man-made structures, new or old, within the proposed construction site for the new facilities. On the basis of the cultural resource survey conducted for the area, no archeological sites are located within the proposed building footprint, to include the proposed parking areas.

3.9 Socioeconomics

3.9.1 Demographics

In 2000, DeKalb County had a population of 64,452. The largest cities within DeKalb County are Fort Payne and Rainsville. Fort Payne's population of 12,938 accounts for approximately 20 percent of the total county population, while the Rainsville's population of 4,499 accounted for approximately 6 percent of the total.

DeKalb County is relatively sparsely populated, with a 2000 population density of 82 people per square mile, compared to 342 persons per square mile in Madison County and a state average of 88 persons per square mi (U.S. Census Bureau, 2001b).

3.9.2 Regional Employment and Economic Activity

Total employment, including part-time positions, in DeKalb County in 2000 was 33,530. The unemployment rate in the DeKalb County area was at 5.4 percent in June, 2004, which is slightly lower than the State of Alabama and national averages. There are approximately 5,860 DeKalb County citizens who commute to another county to work and about 1,300 citizens who work out of state.

The work force of DeKalb County is made up of manufacturing (39.9 percent), services (29.5 percent), government (6.9 percent) and other (23.9 percent). The county's various occupations range from bakery, hosiery, and textiles to electronics, metal fabricating, and plastics.

3.9.3 Income

In 2000, annual per capita income was $15,818 for DeKalb County. The median household income was $30,137, placing the area under the Alabama average of $34,135 and under the national average of $41,994.

3.9.4 Housing

DeKalb County offers a variety of residential housing options, including single-family detached residences, apartments, and condominiums. The July 2000 median home sales price in DeKalb County was $46,800. The average house value was $61,700.

3.9.5 Schools

There are two school districts in DeKalb County, the DeKalb County School District and the Fort Payne City School District.

The DeKalb County School System has a total of 14 schools: 6 rural schools which include grades K–12, 2 junior high schools, and 4 high schools. In addition, the district has one alternative school for grades 5–12, and one vocational school. More than 7,950 students were enrolled in DeKalb County Schools during the 2003–04 school year. (National Center for Education Statistics (NCES) 2003)

The Fort Payne City School District includes two elementary schools, one middle school, and one high school. According to the NCES, there were 2,691 students enrolled in the Fort Payne City School District during the 2003–04 school year. Post secondary education in DeKalb County is provided by Northeast State Community College, located on the Jackson-DeKalb County line. The college provides a 2-year program. Recently receiving community college status, the school is developing technical courses for industries in DeKalb and Jackson Counties. Gadsden State College, located about 35 mi south of DeKalb County, also

provides 2-year programs and technical degrees. Jacksonville State University is located approximately 80 mi from Fort Payne and provides 4-year and graduate programs. (Economic Development Authority (EDA) 2002)

3.9.6 Medical Facilities

DeKalb County is served by the 134-bed, acute-care Baptist DeKalb Medical Center, located in Fort Payne. Baptist DeKalb's emergency services department is on hand to provide convenient comprehensive medical care. Baptist DeKalb's Level III trauma system is fully equipped and staffed 24-hr-a-day, 7 days a wk with physicians and nurses who have the special training and skills.

A county ambulance service provides emergency care to assist fire departments and volunteer fire departments in the county, and have paramedics on staff.

3.9.7 Fire Protection

Fire protection for the future Little River Canyon Center (LRCC) comes from the Adamsburg Volunteer Fire Department (AVFD), which is within 5 mi of the building site. They have two fire engines and one tanker service truck.

The Fort Payne Fire Department (FPFD) is backup, with a Mutual Aid Agreement to the AVFD.

3.9.8 Recreation

DeKalb County is abundant in recreational opportunities. In addition to the Little River Canyon National Preserve, there are five parks, and a wide variety of recreational options offered by city facilities, such as tennis courts, softball and baseball, soccer, and golf courses. Auditoriums and theaters offer concerts, ballet, performances of plays and musicals by national touring companies, film festivals, and other performing arts activities that are available throughout the year in the area.

Little River Canyon National Preserve is the nation's newest national preserve. This preserve consists of approximately 16,000 acres. The Little River Management area provides thousands of acres of hunting land featuring quail, deer, turkey, and other small game. Nearby Jackson County also has thousands of acres of management area for hunting.

DeSoto State Park features cabins, campgrounds, fishing, waterfalls, hiking trails, and the annual Colorfest in nearby Mentone, while Bucks Pocket State Park is located approximately 36 mi from Fort Payne.

3.9.9 Protection of Children

On April 21, 1997, the President issued Executive Order (EO) 13045, "Protection of Children from Environmental Health Risks and Safety Risks," which recognized that a growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health and safety risks. This EO required federal agencies, to the extent permitted by law and mission, to identify and assess such environmental health and safety risks.

EO 13045 does not provide guidance on the ages of the children to be protected. However, the Federal Interagency Forum on Child and Family Statistics (FIFCFS), which was founded in 1994 and formally established by the EO, focuses on those aged 17 and under (FIFCFS, 1997).

3.10 Infrastructure

3.10.1 Utilities

Potable and Industrial Water Use

Potable water would be supplied to the area by the Fort Payne Water Board. It originates from a spring fed reservoir (at 67 St in Ft. Payne) located approximately 8-mi west of the future facility.

The water is processed in a 9-million gal surface water treatment plant, and is piped up the mountain using a primary and secondary pumping station to a 3.5-million gal storage tank. Water will be delivered to the facility in a 6-in pipe capable of supplying over 100 gpm.

Solid Waste

Refuse and nonhazardous waste in the proposed LRCFS area is accumulated in dumpsters and collected and disposed of by the City of Ft. Payne. The city also runs a recycling center and would recycle paper, glass, plastic, and aluminum generated and separated by the Field School. The LRCFS may generate as much as 200 lbs of solid waste per day.

During construction, the general contractor will be responsible of disposing for construction debris.

Wastewater

Wastewater at the proposed LRCFS would consist of sewage. Once operational, the building would be serviced by a septic tank system. Tertiary wetlands are being considered, both as a supplement to the septic system and an educational opportunity for visitors. The septic system consists of tanks and discharge lines, which discharge along the side of the property.

Energy

The area proposed for building the LRCFS would receive it's electrical power from Ft. Payne Improvement Authority. It is routed through the Little River Substation located one mile away from the future facility. Currently, all that is available at the site is 7,200 V single phase 60 Hz power. It is possible to run three-phase power to the site with construction of a 1-mile line from the substation to the location of the Field School.

3.10.2 Transportation

Roads

The LRCFS site is located on the north side of Alabama Highway 35 approximately 500-ft west of the intersection of Highway 35 and Highway 176. The proposed driveway would intersect with Highway 35. The site is bounded to the north by Adamsburg-Hillbridge road. Traffic on all three roads is considered to be light.

4. Environmental Consequences

4.1 Land Use

4.1.1 Preferred Alternative

The 50-acre site proposed for the LRCFS borders the Little River Canyon National Preserve, but is not a part of the preserve. However, much of the land surrounding the proposed site is used for recreational activities such as hiking, backpacking, swimming, white-water rafting, and camping. In addition, the surrounding area offers sanctuary to a number of rare plants and animals. The site proposed for construction of the new LRCFS was privately owned by Alabama Power Company and was not being used. In addition, the vacant property had been clearcut after an ice storm, which conflicted with the land use of the bordering National Preserve.

Construction of the new LRCFS at the site will make the site more compatible with its surroundings. Learning station topics at the proposed LRCFS such as interpretive hikes, archaeology, rocks and soils, water quality, coal, fossils and fuel, water sheds, electricity, compass or GPS course, nature art, canyon creatures, Native American storytelling, or critter tales will enhance the property's affect on the bordering National Preserve. Therefore, any impacts to land use of this site would be of a positive nature.

4.1.2 No-Action Alternative

Under the no-action alternative, the new facility would not be constructed; therefore, land use would not be affected.

4.2 Air Quality

As discussed in section 3.3, DeKalb County is located in an area designated as attainment for all the criteria pollutants and therefore there are no general conformity issues to be addressed according to the federal general conformity regulations. However, analyses to estimate impacts to air quality from construction and operation of the LRCFS are given in section 4.2.1.

Activities associated with the proposed construction of the LRCFS that have the potential to affect air quality include the operation of construction equipment and grading and paving operations.

Once the facility is built, minor impacts to air quality expected to occur from daily operations. Geothermal technologies, supplemented with electric, will provide environmentally friendly heating and cooling to the proposed facility, and no laboratory areas that would require vents are proposed. There will be approximately 20 full-time employees staffing the LRCFS, which would have very minimal impact to emissions released, and an average of 200,000 persons are estimated to visit the LRCFS annually. DeSoto State Park officials anticipate that most visitors to LRCFS will result from persons already visitors other nearby attractions, such as the Little River National Preserve and DeSoto State Park. However, analyses included anticipated vehicle emissions due to the estimated annul visitors expected. Therefore, some minor impacts to air quality due to the operation of the LRCFS are anticipated.

4.2.1 Preferred Alternative

Emissions that would be generated by the construction of the proposed new facility would be in the form of either gaseous or particulate pollutant emissions. Gaseous emissions would occur from heavy-duty construction equipment and vehicle travel to and from the site by construction workers. Emissions would consist primarily of combustion products. Particulate matter in the form of dust emissions would also be generated during the construction phase from excavation, earth moving, construction of the building, and traffic on unpaved surfaces.

The U.S. Air Force's Air Conformity Applicability Model (ACAM) was used to analyze the potential impacts from construction of the proposed facilities. The model is a series of calculations used to estimate the emissions per calendar year of criteria pollutants. Calculations were made for grading equipment, grading operations, construction worker trips, stationary equipment, mobile equipment, and asphalt paving. Details of the ACAM calculations are provided in appendix B.

On the basis of the results of the analysis, emissions of all criteria pollutants from construction of the new facility are estimated to be below the *de minimis* levels, and thus, are not expected to significantly affect air quality. The estimated emissions of criteria pollutants for the construction of the LRCFS are presented in table 6.

Table 6. Comparison of estimated annual emissions due to construction.

Pollutant	2004	2005	*De minimis* level (tons/yr)
VOCs	0.273	1.372	50
NOx	1.538	0.331	100
PM_{10}	3.398	0.026	100
CO	4.222	1.020	100
SO_2	0.179	0.039	100

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

In addition to having emissions below *de minimis* levels, analysis of federal actions also must demonstrate that the proposed action does not constitute a regionally significant action, which is defined as an action that contributes 10 percent or more of total basin-wide emissions.

Had DeKalb County been in nonattainment status, Alabama would have an approved emissions budget to show eventual attainment. However, since the county is in attainment for all NAAQS, no federally approved emission budget exists. Consequently, there is currently no emissions budget for the purpose of conformity analysis for DeKalb County, Alabama. On the basis of emissions inventories for other basins, 10 percent of total emissions usually are several orders of magnitude below the *de minimis* levels. Therefore, because the emissions for the proposed action at LRCFS are below the *de minimis* levels, they also are expected to be several orders of magnitude below the regional significance criteria, and the proposed action would conform.

This conclusion is further supported by the fact that that the emissions for the proposed LRCFS are all very small fractions of a percent of the current DeKalb County emission inventory, as shown in table 7.

Table 7. Comparison of estimated emissions due to construction of LRCFS to DeKalb County emissions inventory.

	VOCs	NOx	PM_{10}	CO	SO_2
Emissions Inventory (tons/yr)	8,110	3,690	9,563	36,967	691
Percent of Inventory					
2005	0.034	0.042	0.036	0.011	0.026
2006	0.017	0.009	0.0003	0.003	0.006

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

On the basis of the above comparisons of the emissions expected from the construction of the proposed new facility to General Conformity *de minimis* values and to the 2003 emissions inventory for DeKalb County, the proposed action is not expected to cause a significant impact to air quality due to construction activities.

Emissions that would be generated due to operation of the new facility of the proposed new facilities would be in the form of gaseous emissions due to vehicle travel to and from the site by visitors. Emissions would consist primarily of combustion products.

Again, the U.S. Air Force's ACAM was used to analyze the potential impacts from operation of the proposed facility. Two hundred thousand persons are estimated to visit LRCFS annually, with the majority being school children arriving in buses and vans. Therefore, calculations were made for 7,000 visitor trips. The details of the ACAM calculations are provided in appendix B.

On the basis of the results of the analysis, emissions of criteria pollutants resulting from operation of the new facility are estimated to be below the *de minimis* levels and are not expected to significantly affect air quality. The estimated emissions of criteria pollutants for the construction of the LRCFS are presented in table 8.

Table 8. Comparison of estimated annual emissions due to operations.

Pollutant	2006 and beyond	*De minimis* level (tons/yr)
VOCs	0.058	50
NOx	0.055	100
PM_{10}	0.008	100
CO	0.956	100
SO_2	0.000000	100

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

In addition, the potential emissions from operation of the proposed LRCFS were also compared to the region's emissions burden. The estimated emissions of criteria pollutants from operation of the LRCFS are an extremely small fraction of the total emissions for the region, as shown in table 9.

Table 9. Comparison of estimated emissions due to operation of LRCFS to DeKalb County emissions inventory.

	VOCs	NOx	PM_{10}	CO	SO_2
Emissions Inventory (tons/yr)	8,110	3,690	9,563	36,967	691
Percent of Inventory					
2006 and beyond	0.0007	0.002	0.0001	negligible	0

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

4.2.2 No-Action Alternative

Under the no-action alternative, the proposed facility would not be constructed; therefore, there would be no impacts to air quality.

4.3 Noise

4.3.1 Preferred Alternative

As discussed in section 3.4, construction of the new facility is expected to generate noise levels in the range of 78–89 dBA, approximately 50 ft from the construction sites. On the basis of the EPA publication, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances, PB 206717* (EPA, 1971), noise levels at 50 ft from a source decrease by approximately 3 dBA over a hard, unobstructed surface such as asphalt, and by approximately 4.5 dBA over a soft surface such as vegetation. The conditionally acceptable range of noise levels for residential areas is 60–70 dBA.

Ambient noise levels, at and around the construction sites, would temporarily increase during the construction of the facilities. The increased noise levels would be short-term (approximately 1 yr) and limited to normal weekday working hours. The proposed construction site for the LRCFS is approximately one-half mile from the nearest residential area (County). On the basis of the EPA estimates of noise dissipation discussed above, noise levels during construction of the new facilities are expected to be within or below the residential acceptable range in the residential areas closest to the proposed construction sites. Noise levels that would be generated during the operation of the new LRCFS would be below the residential acceptable range in these communities. After the new facility is constructed, noise levels are expected to be similar to those that currently exist. For these reasons, construction and operation of the LRCFS at the proposed construction site is not expected to have significant noise impacts.

4.3.2 No-Action Alternative

Under the no-action alternative, no changes in noise levels would occur because no new construction would occur.

4.4 Topography, Geology, and Soil

4.4.1 Topography

Preferred Alternative

Construction of the new facility at the proposed LRCFS site would have minor impacts on the existing topography during site clearing and grading. The architects and building developers for the proposed LRCFS plan to make use of existing topography. Since the proposed building site sits on the side of a hill and is sloped, the building is planned to step down the side of the slope.

No-Action Alternative

Topography would not be affected under the no-action alternative because no new construction would occur.

4.4.2 Geology

Preferred Alternative

Site clearing and grading for the new facilities would not extend more than a few feet below grade and would not affect subsurface geological formations. The foundation of the LRCFS building would not impact on the bedrock zone at the site. Foundation anchors would not extend more than 5 ft into the bedrock, and therefore, will not significantly affect this zone. Overall impact to the geology of this area would be minimal.

No-Action Alternative

Geology would not be affected under the no-action alternative because no new construction would occur.

4.4.3 Soils

Preferred Alternative

Construction of the new facilities would result in temporary minor impacts to onsite soils. Erosion control measures would be implemented during construction to minimize runoff. Such controls may include the use of silt fences and hay bales, and the seeding of cleared areas that are to remain exposed for long periods of time. After construction is completed, erosion will be limited by restoring vegetation to the area using native plant materials.

No-Action Alternative

Soils would not be affected under the no-action alternative because no new construction would occur.

4.5 Water Resources

4.5.1 Surface Water

Preferred Alternative

Construction of the new facilities would have no adverse effects on surface water and some minimal impacts relating to storm-water management. Surface waters that exist on the 50-acre site proposed for the LRCFS are streams located approximately 80–90 ft below the proposed construction site. No surface waters exist within the proposed construction site; therefore, no surface waters will be directly affected by construction activities. Storm-water runoff would be managed by silt fences and traditionally approved means. Some storm water will be collected with an underground drainage system and reused as gray water in toilets or irrigation systems. The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. All NPDES requirements for the new LRCFS will be met during the permitting phase of the project.

No-Action Alternative

Under the no-action alternative, no impacts to surface water would occur because no new construction would occur.

4.5.2 Groundwater

Preferred Alternative

Construction and operation of the new LRCFS facility would not result in significant impacts to groundwater. The construction of the LRCFS building is anticipated to be anchored using footings that would not require dewatering; therefore, removal of groundwater within the residuum zone during construction would not occur. Any groundwater that is removed during construction would be disposed of properly.

No-Action Alternative

Groundwater would not be affected under the no-action alternative because no new construction would occur.

4.6 Biological Resources

4.6.1 Vegetation

Preferred Alternative

The proposed construction site for the new LRCFS has been clear-cut; therefore, construction of the facility will have only minor impacts on vegetation. A buffer of tree growth exists along the property frontage along Highway 35 and the 10 acres that boarders the Little River National Preserve and will remain undisturbed. Access drives are being proposed to disturb a minimal number of trees along the front of the property and the land native plant material will be used to provide new growth to the construction area. Overall, minor impacts to vegetation can be anticipated.

No-Action Alternative

Vegetation would not be affected under the no-action alternative because no new construction would occur.

4.6.2 Wetlands

Preferred Alternative

Figure 9 shows the location of the proposed facility in reference to the location of the wetlands identified by the Wetland Delineation and Protected Species Survey conducted in December, 2003. A copy of this survey is attached as appendix A.

The conceptual layout of the proposed LRCFS shows that no wetlands are located within any of the proposed construction sites for the new facilities; therefore, construction and operation of the facility will have no effect on wetlands. However, should development of the site impact jurisdictional wetlands or streams, coordination with the Army Corps of Engineers (ACOE) would be required.

No-Action Alternative

Wetlands would not be affected under the no-action alternative because no new construction would occur.

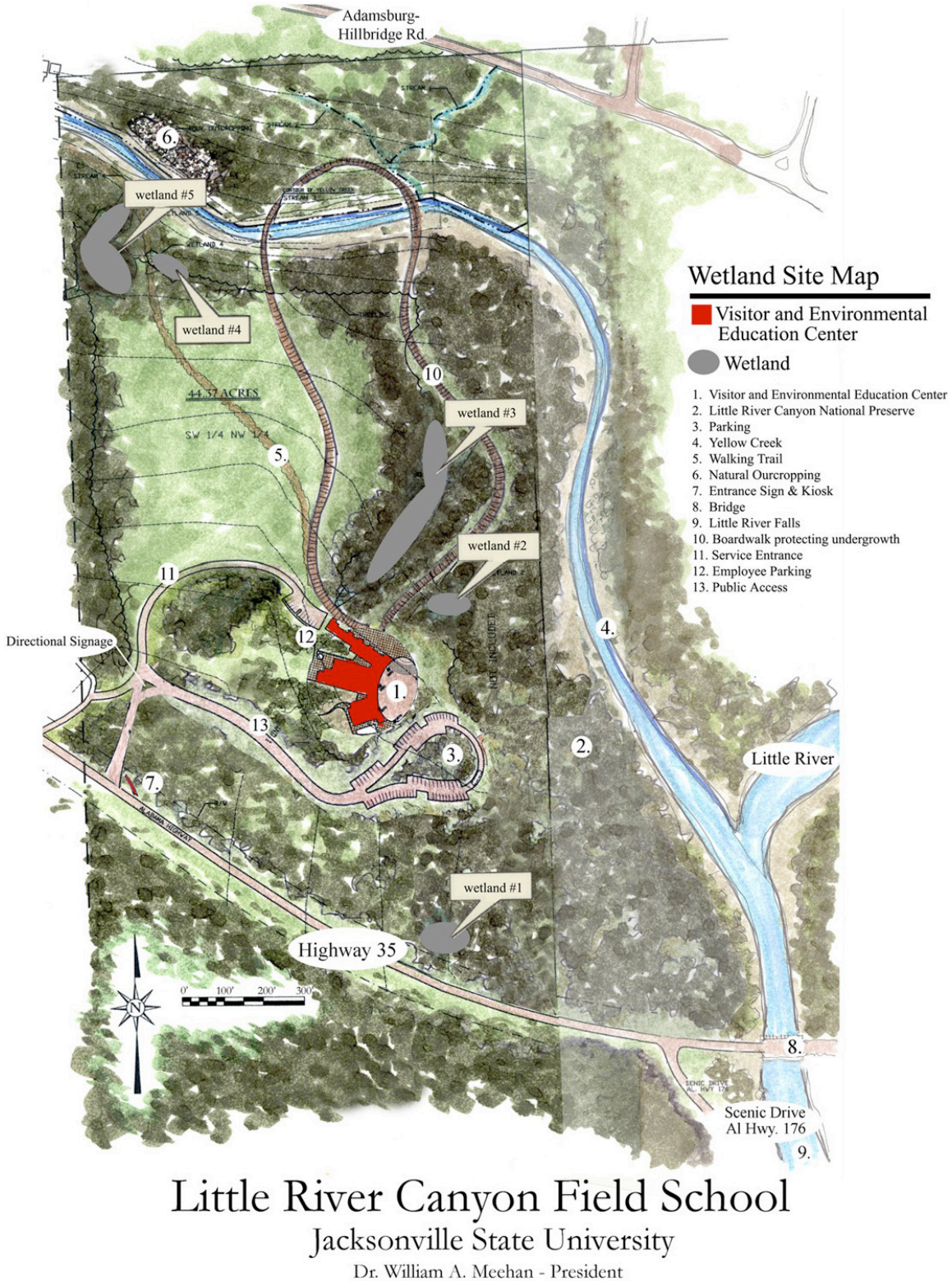


Figure 9. Location of the proposed LRCFS facility in reference to the wetlands identified by the Wetland Delineation and Protected Species Survey conducted in December 2003.

4.6.3 Wildlife

Preferred Alternative

Because most of the proposed site for construction of the new LRCFS has been clearcut it would not provide a high-quality wildlife habitat. However, the site does provide habitat that would support urbanized wildlife species adapted to such environments such as common song birds, squirrels, raccoons, deer, and mice. Urbanized wildlife that may be disturbed by construction activities could temporarily relocate to adjacent areas that provide similar habitat. The postconstruction environment of the site will provide similar or even improved habitat for wildlife. As a result, construction of the new facilities is not expected to result in significant impacts to wildlife.

No-Action Alternative

Wildlife would not be affected under the no-action alternative because no new construction would occur.

4.6.4 Protected Species and Habitats

Preferred Alternative

Protected species studies were conducted within the proposed LRCFS property to determine the occurrence, or potential occurrence, of federally-listed species for DeKalb County. An office review by JSU personnel resulted in development of a list that included eight species: four faunal and four floral. A list of these species was given in section 3.7.4.

In addition, JSU conducted a field study to determine the presence of suitable protected species habitat and potential occurrence of these species. The entire project area was traversed on foot to evaluate the potential occurrence of protected species. Table 10 provides a description of the preferred habitats for these species.

Table 10. Species/habitat matrix.

Habitat	Sub-Habitat	Species
Terrestrial	Open fields or in thickets along woodland borders.	Eggert's sunflower
	Seepy bogs, poorly drained oakpine flatwoods, red maple-blackgum swamps, or along sandy banks of streams.	Green pitcher plant
	Rocky or gravel shoals and margins of clear, swift-flowing streams	Harperella
	Caves near water	Gray bat and Indiana bat
Aquatic	Shallow water, small-to-medium warm-water streams with rocky bottoms	Kral's water plantain
	Medium-to-large streams with sand and gravel bottoms	Blue shiner, fine-lined pocketbook mussel

No protected species were observed on the proposed site, however, suitable habitat was observed for four of the species: green pitcher plant *(Sarracenia oreophila)*, Kral's water plantain *(Sagittaria secundifolia)*, harperella *(Ptilimnium nodosum)*, and Indiana bat *(Myotis sodalist)*. Of these species, the most likely to occur within the terrestrial portion of the site, on wetlands 3 and 5, is the green pitcher plant.

Due to the amount of previous disturbance in the study area, it is unlikely that these species would occur. However, the projected construction site for LRCFS will not impact any of the areas determined to be suitable habitat for protected species. Therefore construction of the new LRCFS facility at the proposed site is expected to have a minor impact on protected species.

No-Action Alternative

Protected species and habitats would not be affected under the no-action alternative because no new construction would occur.

4.7 Cultural Resources

Preferred Alternative

JSU's Archaeological Resource Laboratory (ARL) conducted two separate phase I investigations of the proposed LRCFS site in November, 2003. The first area surveyed covered just under 15 acres and the following survey covered an additional 30 acres. Procedures and results are included as appendix C of this EA.

Prior to field work, JSU conducted a background search in an attempt to locate previously recorded cultural resources, original landowners, and any historically significant information in the area. This investigation included queries to the Alabama State Site File (ASSF), the National Register of Historic Places (NRHP), the Alabama Register of Landmarks and Heritage (www.perserveala.org/alabamaregister.html), and the Bureau of Land Management (BLM) General Land Office (GLO).

The ASSF contained 12 entries for archaeological sites recorded within 1 mi of the project area, but none are within the 50-acre LRCFS site, as shown in figure 10. The NRHP contains 11 listings for DeKalb County, however, none were in the vicinity of the proposed LRCFS site. The Alabama Register of Landmarks and Heritage includes 42 listings in DeKalb County. One of the listings, Edna Hill Methodist Church is within 1 mi of the proposed project area. Finally, the BLM_GLO confirmed the transfer of six land titles to six individuals between 1847 and 1894.

A locale is the term used to define the location of archeological material. Cultural resources identified within the project locale are further recorded as either sites or isolates. Sites are defined as three or more artifacts within 10m of each other, while an isolates is defined by three or fewer artifacts within an area greater than 10m. As a result the investigations, six locales yielded cultural material within the site area. In addition, a seventh locale was observed and recorded, just outside the project area. Of these seven locales, four received official Alabama site numbers and were added to the state database. Figure 10 shows the location of the proposed facility in reference to the location of the seven locales identified during the Archeological Survey. As shown in figure 10, the proposed facility would be strategically located so that none of the identified locales are disturbed. Therefore, there are only minor impacts to cultural resources. A copy of this survey is attached as appendix C.

No-Action Alternative

Cultural resources would not be affected under the no-action alternative because no new construction would occur.

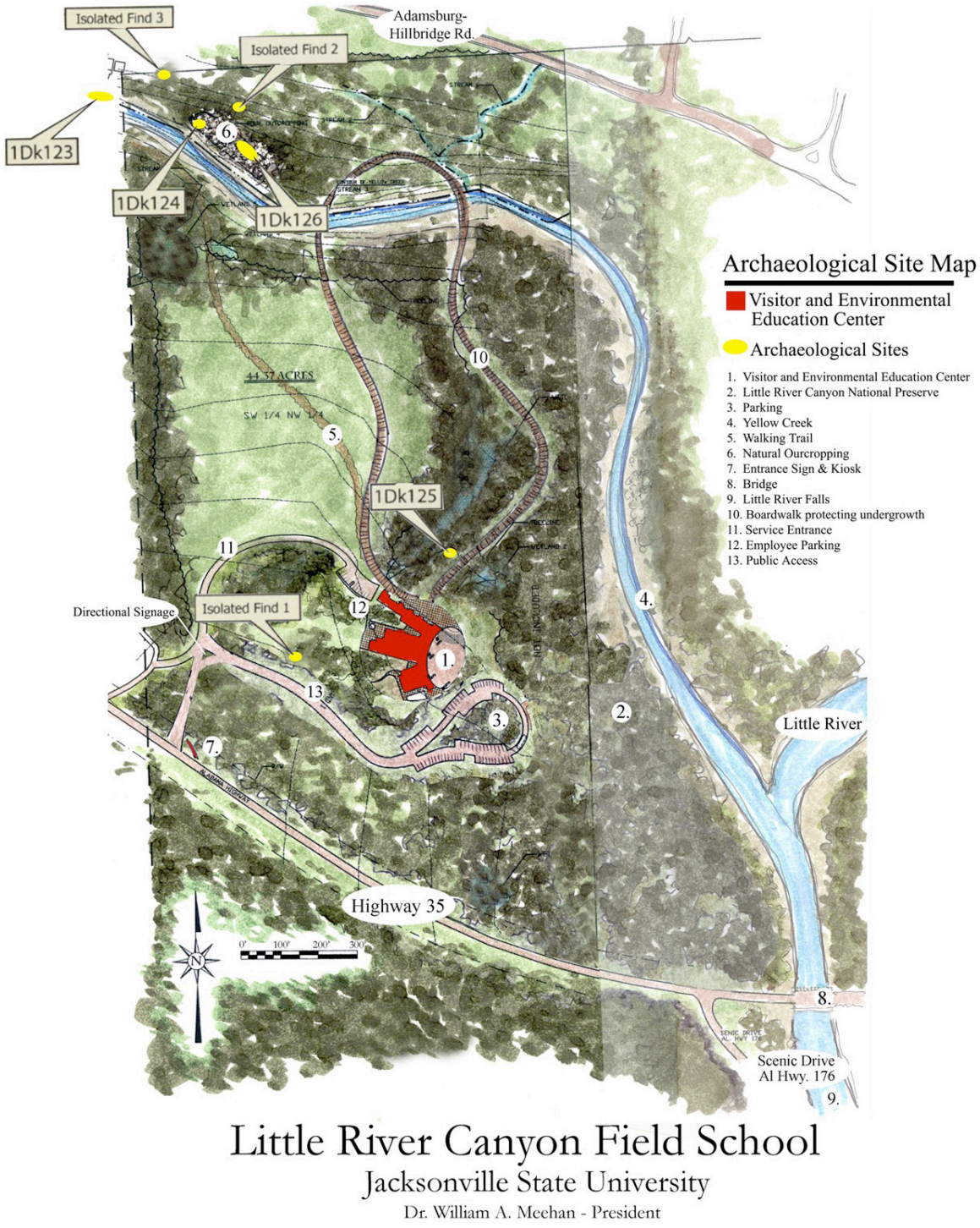


Figure 10. Archaeological locales recorded during the archeological survey of the project area

4.8 Socioeconomics

4.8.1 Demographics

Preferred Alternative

Construction and operation of the proposed LRCFS at the proposed site will not result in an increase or decrease in personnel, only relocations of personnel from existing facilities. The labor force of the local area is expected to be able to provide workers for the construction of the facility without additional persons relocating to the area. As a result, there will be no impact to the local population.

No-Action Alternative

Under the no-action alternative, the new facilities would not be constructed; therefore, there would be no effect on demographics.

4.8.2 Regional Employment and Economic Activity

Preferred Alternative

The economic effects of a proposed action are caused by a change in the demand for goods and services in the local economy. Primary (or direct) effects are caused by initial changes in expenditures, employment, salaries, and population directly related to the proposed action. Secondary effects are induced by the process of spending and re-spending, and the relationship between what is needed to produce goods and services and the commodities that are produced.

Construction of the new LRCFS would not have a significant impact on the total labor force, employment, or unemployment in the region because of the small number of jobs that would be created. The economic effects of the proposed action would include both temporary effects associated with construction and long term effects due to the operation of the field school. The LRCFS would offer programs and opportunities to groups and individuals who visit; therefore, businesses near the LRCFS, such as gas stations and fast-food restaurants, could benefit from additional sales to visitors. In summary, the impacts on regional employment and economic activity due to the construction and operation of the proposed LRCFS would be positive.

No-Action Alternative

Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no effects on the total labor force, employment, or unemployment in the region.

4.8.3 Income

Preferred Alternative

The impact that construction of the LRCFS would have on the local economy is expected to be minimal compared to the overall economy of DeKalb County. Therefore, impacts to local salaries from construction are expected to be positive, but minimal.

Operating the new facilities would require a minimal addition of personnel; therefore, there would be only a minimal impact on income due to operation of LRCFS.

No-Action Alternative

Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no effect on income.

4.8.4 Housing

Preferred Alternative

Construction and operation of the LRCFS at the proposed site will not result in a significant increase or decrease of personnel; therefore, there will be no impact to housing.

No-Action Alternative

Under the no-action alternative, the new facility would not be constructed; therefore, there would be no effect on housing.

4.8.5 Schools

Preferred Alternative

Construction of the LRCFS at the proposed site will not result in an increase or decrease of personnel; therefore, there will be no effect on schools due to construction.

Educational opportunities offered to area schools by the LRCFS will result in a positive impact to those schools.

No-Action Alternative

Under the no-action alternative, the new facility would not be constructed; therefore, there would be no effect on schools.

4.8.6 Medical Facilities

Preferred Alternative

Construction of the LRCFS at the proposed site will not result in an increase or decrease of permanent personnel; therefore, there will be no constant effect on medical facilities. There could, however, be minimal impacts on medical facilities due to the flow of visitors to the school increasing the potential for injuries and illness.

No-Action Alternative

Under the no-action alternative, the new facility would not be constructed; therefore, there would be no effect on medical facilities.

4.8.7 Fire Protection

Preferred Alternative

Construction and operation of the LRCFS would result in a potential for minimal impacts on fire protection in the area.

No-Action Alternative

Under the no-action alternative, fire protection would not be affected because the new facility would not be constructed.

4.8.8 Recreation

Preferred Alternative

The current land proposed for construction of the LRCFS consists entirely of vacant, unused land. Construction and operation of the new LRCFS will directly affect the recreational use of the site. The new LRCFS will enhance recreational opportunities in the area by offering programs such as hiking, backpacking, nature watching, etc. Therefore, the impact to recreation will be positive.

No-Action Alternative
Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no effect on recreation.

4.8.9 Protection of Children
Preferred Alternative
Construction of the LRCFS at the proposed site would not result in significant impacts related to air quality, groundwater, surface water, or hazardous and toxic materials and wastes; therefore, children would not be disproportionately affected.

No-Action Alternative
Under the no-action alternative, the new facility would not be constructed; therefore, children would not be affected.

4.9 Infrastructure
4.9.1 Utilities
The LRCFS is proposed to be designed and built under the Leadership in Energy and Environmental Design (LEED) certification program. LEED is administered by the U.S. Green Building Council, and is based on facets including water preservation and efficiency, conservation of materials and resources, recycling, indoor environmental quality, and sustainable site planning.

LEED is a voluntary, consensus-based national standard for developing high performance, sustainable buildings using a standard benchmark of measurement for assessing building performance, and meeting sustainability goals.

Implementation of LEED designs such as no-flush toilets and rain water collection for irrigation would result in an overall decrease in utilities as compared to a traditionally designed building.

Potable Water Use
Preferred Alternative. Both the workforce and visitors to the LRCFS would require water for potable and sanitary uses; therefore, operations of the LRCFS would cause a minor increase to the area's potable water use. Modifications to the existing water system would be required to provide the necessary water; therefore, minor impacts to the area's water supply are anticipated.

No-Action Alternative. Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no change in water usage.

Solid Waste
Preferred Alternative. Solid waste generated due to construction of the LRCFS would be disposed of by the contractor; therefore, minimal impacts are expected.

Solid waste generated due to operations of the LRCFS would consist of a relatively minimal amount of debris and waste generated by workforce personnel during operations and by visitors to the site. All solid waste would be containerized for disposal. Minimal impact is expected.

No-Action Alternative. Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no change in solid waste generation.

Waste water

Preferred Alternative. Domestic waste water generated at the proposed LRCFS would result from daily workforce personnel and visitors to the facility. Approximately 20 persons would be working at the field school on a daily basis and approximately 200,000 visitors are anticipated annually. Domestic waste water generated at the LRCFS would be expected to be about 600 gpd; therefore, impacts are expected to be minimal.

No-Action Alternative Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no change in wastewater generation.

Energy

Preferred Alternative. The Alabama Power Company supplies electricity to this area at the standard 60 MHz rate. The site would require extension of electrical lines from existing lines near Highway 35, a distance of less than 1 mi. The increased demand for energy would be minimal compared to the existing use in the DeKalb County area. In addition, the new facility will incorporate upgraded energy-efficient heating, ventilation, and air-conditioning (HVAC); lighting systems; and materials; therefore, minimal impact is expected.

No-Action Alternative. Under the no-action alternative, the LRCFS would not be constructed; therefore, there would be no change in energy consumption.

4.10 Cumulative Impacts

This EA attempts to qualify and quantify the impacts to the environment that would result from the proposed action when added to other past, present, and reasonably foreseeable future actions. These impacts can result in minor but collectively important actions taking place over a period of time.

When considering cumulative impacts, the geographic area of potential impacts is defined before determining what past, present, and future actions are relative to the analysis.

The LRCFS project plans would require approximately 1½ years to design and construct. A maximum of 5 acres on the 50-acre site would be disturbed.

Direct impacts to the cultural, visual, soil, vegetation, wildlife, and threatened and endangered species would be positive due to cleaning the area of debris and enhancing the natural setting. In addition, enhancing the educational process would bring awareness and community sensitivity towards the area's environmental resources.

Ecotourism, heritage tourism, and cultural tourism would attract new visitors to the area and enhance economic viability in the surrounding communities.

The Department of Transportation (DOT) has future plans to move Highway 35 to support a bridge replacement. This move would affect approximately one-half acre of the LRCFS's land. Overall impact resulting from the DOT project would be positive, as the new bridge would help transportation coming to and from LRCFS.

5. References

ADEM 2004 Alabama Department of Environmental Management (ADEM), 2004 http://216.226.179.150/ftproot/waterquality/cusize.doc

EDA 2002 Economic Development Authority, DeKalb County, Alabama. 2002. http://www.dekalbeda.com/index.asp

EPA 2003 U.S. Environmental Protection Agency. 2003. http://www.epa.gov/oerrpage/superfund/programs/risk/airmodel/johnson_ettinger.htm.

EPA 2004 U.S. Environmental Protection Agency. 2004. *Upper Coosa Basin Watershed Management Plan.*

JSU 2004 Jacksonville State University. 2004. Geology and Soils Study of Little River Canyon Field School Site.

NCES, 2003 National Center for Education Statistics, NCES. 2003.

UA 2004 The University of Alabama, Department of Geography, College of Arts and Sciences. 2004. http://bama.ua.edu/~maplib/full%20place%20name%20page.htm

UG 2004 University of Georgia, Institute of Ecology. 2004. River Basin Science http://www.rivercenter.uga.edu/education/k12resources/basinsofga.htm

USDA 1985 USDA-NRCS in cooperation with ADECA. March, 1985. Hydrologic Unit Map with Drainage Areas by Counties and Subwatersheds.

USGS 1989 U.S. Geological Survey in Cooperation with the Alabama Department of Environmental Management. 1989. Water-Resources Investigations Report 88-4177

6. List of Preparers

Table 11. List of preparers.

Name	Title	Primary Responsibility
W. Peter Conroy	Director JSU Environmental Policy and Information Center (EPIC) and Field School	Wetland Delineation and Protected Species Survey, and Archeological Survey.
Donna L. Holland	Environmental engineer	Project Manager, overall analysis and document preparation, NEPA consistency, air quality analysis.
Jay W. Jenkins	Architect	Conceptual site layouts.
D. Scott Stevens	GIS consultant	Document graphics.

APPENDIX A
Wetland Delineation and Protected Species Survey

Wetland Delineation and Protected Species Survey

Little River Canyon Field School Site

DeKalb County, Alabama

December 2003

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EXECUTIVE SUMMARY

Executive Summary

The Little River Canyon Field School, a project of Jacksonville State University's Environmental Policy and Information Center, plans to build an educational facility in DeKalb County, Alabama. As part of the development process for the facility, ecological studies were performed within the approximately 50-acre site. The ecological studies included a delineation of Section 404 jurisdictional boundaries following the accepted methodology of the Department of the Army Corps of Engineers (ACOE). Office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. This report includes a site description, results of field surveys, and an overview of Section 404 permit requirements.

Field studies identified the presence of two jurisdictional wetlands, three isolated, non-jurisdictional wetlands, and four jurisdictional streams. The final determination of isolated, non-jurisdictional is regulated by the ACOE. Please refer to the Jurisdictional Studies section of this report for more information pertaining to the type and location of the jurisdictional systems.

Review of existing literature and available databases determined that protected species are listed for DeKalb County. These species are comprised of eight federally-listed species. Field studies were conducted to determine the presence of suitable protected species habitat and potential occurrence of these species. Potential habitat was identified for four federal-listed species. These include green pitcher plant (*Sarracenia oreophila*), Kral's water plantain (*Sagittaria secundifolia*), Harperella (*Ptilimnium nodosum*), and Indiana bat (*Myotis sodalis*). No specimens were observed during the field studies. A detailed discussion of methodologies and protected species requirements is included in the Threatened and Endangered Species section of this report.

Should development of the project impact jurisdictional systems, coordination with the ACOE would more than likely be required. Unavoidable minor impacts would more than likely be eligible for a Section 404 Nationwide Permit. Refer to Section 4 for more information pertaining to ACOE permitting.

SECTION 1
Introduction

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Introduction

The Little River Canyon Field School (LRCFS), a project of Jacksonville State University's Environmental Policy and Information Center (EPIC), plans to build an educational facility in DeKalb County, Alabama. As part of the development process for the facility, ecological studies were performed within the approximately 50-acre site. The ecological studies included a delineation of Section 404 jurisdictional boundaries following the accepted methodology of the Department of the Army Corps of Engineers (ACOE). Office and field reviews were conducted for animal and plant species listed under the protection of the Endangered Species Act. This report includes a site description, results of field surveys, and an overview of Section 404 permit requirements.

Site Location and Description

The project area is located in central DeKalb County, Alabama. The study area is situated on the Fort Payne, Alabama, United States Geological Survey (USGS) 7.5-minute series topographic map (Figure 1). The LRCFS site is located on the north side of Alabama Highway 35 approximately 500 feet west of the intersection of Alabama Highway 35 and Alabama Highway 176 (Canyon Rim Drive). The site is bounded to the north by Adamsburg-Hillbridge Road. Existing LRCFS property forms the eastern boundary. The western boundary is joined by private property. Access to the site is provided by a dirt road located at the southwestern corner and from Adamsburg-Hillbridge Road.

The majority of the site was clear-cut approximately three years ago. A wooded buffer was left along both sides of Yellow Creek, the major drainage feature on the site. An uncut strip of oak-pine uplands was also left along the frontage adjacent to Highway 35. Below is a brief description of upland communities on the site.

Clear-cut Areas

As previously noted, the majority of the site has been clear-cut. Refer to Figures 2 and 3 for recent aerial photographs of the study area. Refer to Figure 4 for typical conditions within the cutover areas. Vegetation within the cutover area is typical of early successional environments. Species observed include Canada goldenrod (*Solidago canadensis*), Chinese privet (*Ligustrum sinense*), serrate leaf blackberry (*Rubus argutus*), white greenbrier (*Smilax glauca*), dog fennel (*Eupatorium capillifolium*), broom-sedge (*Andropogon virgincus*), and panic grass (*Dichanthelium dichotomum*).

Upland Buffer – Yellow Creek

Both the south and north side of Yellow Creek have a narrow wooded buffer. This buffer has sporadic outcroppings of sandstone (Figure 5). This relatively dry vegetation community is

dominated by deerberry (*Vaccinum stamineum*), scrub pine (*Pinus virginiana*), eastern red cedar (*Juniperus virginiana*), yellow jessamine (*Gelsemium sempervirens*), hickory species (*Carya* sp.), and sweet-gum (*Liquidambar styraciflua*).

Slope and Floodplain –Yellow Creek

The southern slope along Yellow Creek is very steep. It is dominated by mountain laurel (*Kalmia latifolia*), red maple (*Acer rubrum*), rosebay rhododendron (*Rhododendron catawbiense*), Shuttleworth ginger (*Hexastylis shuttleworthii*), smooth rhododendron (*Rhododendron arborescens*), and galax (*Galax urceolata*). The mountain laurel and rosebay rhododendron form a dense understory.

The majority of the northern slope along Yellow Creek is much flatter with some typical floodplain habitat. The dominant species on this side of the creek is American holly (*Ilex opaca*). Other species include mountain laurel, galax, rosebay rhododendron, and loblolly pine (*Pinus taeda*).

Riparian vegetation along Yellow Creek includes tag alder (*Alnus serrulata*), smooth rhododendron, yellow root (*Xanthorhiza simplicissima*), and Virginia-willow (*Itea virginca*). A few specimens of golden club (*Orontium aquaticum*) were observed within Yellow Creek.

SECTION 2
Threatened and Endangered Species

SECTION 2
Threatened and Endangered Species

Overview

Protected species studies were conducted within the Little River Canyon Field School property to determine the occurrence or potential occurrence of federal-listed species for DeKalb County.

Prior to the field studies, an office review of available resources was performed to develop a list of potential federal-listed species for DeKalb County. The tentative list of known protected species was compiled by review of the federal "Redbook" – Region 4 and the June 2003 list from the website of the Daphne field office of the U. S. Fish and Wildlife Service.

The office review indicated that six protected species are known from DeKalb County. Additionally, two species were listed by the U. S. Fish and Wildlife Service (Daphne, Alabama field office) as possibly occurring within DeKalb County. Of these eight species, four are faunal and four are floral.

Field studies were conducted to determine the presence of suitable protected species habitat and potential occurrence of these species. The entire project area was traversed on foot to evaluate the potential occurrence of protected species. There were no protected species observed. However, during the field studies, suitable habitat was observed for four protected species: green pitcher plant (*Sarracenia oreophila*), Kral's water plantain (*Sagittaria secundifolia*), Harperella (*Ptilimnium nodosum*), and Indiana bat (*Myotis sodalis*). Of these species, the most likely to occur within the terrestrial portion of the site (Wetlands 3 and 5) is green pitcher plant. A known locality of this species within 1-mile of the project site was visited to determine the vegetative state for this time of the year. Though the plants had died back, the withered "pitcher"leaves and phyllodes remained readily identifiable. No green pitcher plants or other federal-listed species were observed within the study area.

Due to the amount of previous disturbance in this area, it is unlikely that these species would occur. No observations of suitable habitat or specimens were observed for the remaining species listed.

Please refer to Table 1 for a summary of federal-listed species for DeKalb County. The appropriate designation for each species is included in Table 1. A species/habitat matrix table also was prepared for use by field personnel (Table 2). The table provides information on protected species and their preferred habitat. A brief description of each species follows the table. The description includes an assessment of the potential occurrence of the species within the project area.

Table 1
Summary of Federal -listed Protected Species for DeKalb County

Species	Vernacular Name	Federal Rank	Preferred Habitat
Faunal			
Cyprinella caerulea	blue shiner	T	sandy/gravelly bottoms of medium to large rivers among cobble in cool, clear water
Lampsilis altilis	fine-lined pocketbook mussel	T	sand and gravel bottoms of streams and rivers with good water quality, stable stream channels, and free-flowing water
Myotis grisescens	gray bat	E	caves located within one mile of a river or reservoir
Myotis sodalis	Indiana bat	E	in summer, roost under loose tree bark on dead trees near water
Floral			
Helianthus eggertii	Eggert's sunflower	T	open fields or in thickets along woodland borders
Saracenia oreophila	green pitcher plant	E	seepy bogs, poorly drained oak-pine flatwoods, red maple-blackgum swamps, or along sandy banks of streams
Ptilimnium nodosum	harperella	E	rocky or gravel shoals and margins of clear, swift-flowing streams
Sagittaria secundifolia	Kral's water-plantain	T	sandstone crevices of shoals, or in shallow pools of rapidly flowing streams

E = Endangered; T = Threatened

Table 2
Species/Habitat Matrix

Habitat	Sub-Habitat	Species
Terrestrial	open fields or in thickets along woodland borders.	Eggert's sunflower
	seepy bogs, poorly drained oak-pine flatwoods, red maple-blackgum swamps, or along sandy banks of streams	green pitcher plant
	rocky or gravel shoals and margins of clear, swift-flowing streams	harperella
	caves near water	gray bat and Indiana bat
Aquatic	shallow water, small to medium warm water streams, with rocky bottoms	Kral's water-plantain
	medium to large streams with sand and gravel bottoms	blue shiner, fine-lined pocketbook mussel

Species Descriptions

Blue shiner (*Cyprinella caerulea*) — The blue shiner is a medium-sized minnow of the Coosa River drainage and formerly of the Cahaba River. This species may grow to four inches in total length. It inhabits sandy/gravelly bottoms of medium to large rivers among cobble in cool, clear water. The jurisdictional waters occurring on-site were not large enough to provide potential

habitat for the blue shiner, nor were the substrate appropriate for this species. In addition, previous detailed studies have been conducted within the Little River drainage for the blue shiner. Those studies included sampling on Yellow Creek above the project area. These studies did not identify the blue shiner within Yellow Creek or within the portion of Little River near the project area.

Eggert's sunflower (*Helianthus eggertii*) — This species is listed by the U. S. Fish and Wildlife Service as possibly occurring in DeKalb County. Eggert's sunflower is a perennial aster that grows up to 7 feet tall. Leaves are opposite and mostly lanceolate with mostly smooth edges. The yellow flowers are large (3 inches) and grow on the upper third of the plant. The flowering period is early August to mid September. Habitat for this species is rolling to flat uplands in full sun or partial shade in open fields or in thickets along woodland borders. No potential habitat was observed for this species.

Fine-lined pocketbook mussel (*Lampsilis altilis*) — The fine-lined pocketbook mussel is medium-sized, suboval in shape, and rarely exceeds 4 inches in length. DeKalb County likely constituted part of this species historical range. Currently in adjacent Cherokee County, this species is known from the Coosa River and one of its tributaries, Terrapin Creek. The fine-lined pocketbook mussel is easily confused with a similar species, the orange-nacre mucket (*Lampsilis perovalis*). This mussel lives in the sand and gravel bottoms of streams and rivers. They require good water quality, stable stream channels, and free-flowing water. No potential habitat was observed for this species.

Gray bat (*Myotis grisescens*) — Gray bats are insectivores that normally use caves located within one mile of a river or reservoir, where they hunt and feed over the water. In the summer they establish maternal and bachelor colonies in warm caves. In the winter they relocate and hibernate in small, cold caves. The gray bat has a wingspread of about 11-12 inches and is uniformly dark gray. No potential habitat was observed for this species.

Green pitcher plant (*Sarracenia oreophila*) — The green pitcher plant is a perennial carnivorous herb which is found in seepy bogs, poorly drained oak-pine flatwoods, red maple-blackgum swamps, or along sandy banks of streams flushed periodically by floodwaters. The yellow flowers, which appear from late April to early June, are nodding and solitary on leafless stalks. The tubular pitcher leaves appear in the spring and wither later in the season, however, the sickle-shaped leaves (phyllodes) persist over winter. This species is fire-dependent. Lack of fire allows shrub encroachment of seepage areas, which shades pitcher plants and increases competition. Potential habitat is present within Wetlands 3 and 5. No specimens were observed during field studies. As noted above, a known locality of this species within 1-mile of the project site was visited to determine the vegetative state for this time of the year. Though the plants had died back, the pitcher leaves and phyllodes remained readily identifiable.

Harperella (*Ptilimnium nodosum*)— Harperella is an annual herb which occurs in rocky or gravel shoals and margins of clear, swift-flowing streams, and, in the coastal plain, edges of intermittent pineland ponds. The flowers, which have five white petals and grow in compound

umbels, appear from late May to early July. The leaves are quill-like and hollow, with internal partitions. Harperella varies greatly in height of individual plants. Populations fluctuate from year to year in abundance, being dependent upon the moisture available during the growing season. Potential habitat was present along Yellow Creek, but no species were observed.

Indiana bat (*Myotis sodalis*) — This species is listed by the U. S. Fish and Wildlife Service as possibly occurring in DeKalb County. It is known to occur in adjacent Jackson and Marshall counties. This small bat species is an insectivore with a wingspan of 9 to 11 inches. Indiana bats hibernate in caves, or occasionally abandoned mines, during the winter. After hibernation, Indiana bats migrate to their summer habitats where they usually roost under loose tree bark on dead trees near water. During summer, males roost alone or in small groups, while females roost in larger groups of 100+ bats. Indiana bats also forage in or along the edges of forests. Potential habitat was observed for this species.

Kral's water-plantain (*Sagittaria secundifolia*)— Kral's water-plantain is a perennial aquatic herb that is found in sandstone crevices of shoals, or in shallow pools of rapidly flowing streams. The leaves are narrow and tapered to the tip with broad, stiff bases. Flowers are on leafless stalks and occur in whorls. Male flowers are in the upper whorls and have three white petals. Female flowers have no petals and are on lower whorls. Potential habitat for this species was observed within Yellow Creek.

Conclusion

No federally-listed threatened or endangered species were observed within the study area. During the field studies, suitable habitat was observed for four of the protected species. Due to the amount of previous disturbance and development in this area, it is unlikely that these species would occur within the site.

SECTION 3
Jurisdictional Studies

SECTION 3
Jurisdictional Studies

Overview

Jurisdictional studies were conducted following the accepted methodology of the ACOE. Specifically, field delineations were conducted using the *1987 Federal Manual.* This method focuses on evaluating the presence of three characteristics:

- Wetland Hydrology
- Hyrdophytic Vegetation
- Hydric Soils

For this site, the routine determination method was followed. Standard ACOE Data Forms were completed and are in Appendix A.

Study Results

Jurisdictional studies identified the presence of two jurisdictional wetlands, three isolated, non-jurisdictional wetlands, and four jurisdictional streams. The wetland boundaries were marked with pink flagging labeled – WETLAND BOUNDARY. The centerline of streams (other than Yellow Creek) were marked with blue and white flagging. The boundaries of the wetlands and the centerlines of streams (other than Yellow Creek) were located using sub-meter Global Positioning System technology. Wetland and stream locations are shown on Figure 6. A brief description of each system is below. Refer to Table 3 for a summary of wetlands and streams.

Wetland 1

Wetland 1 is a small depressional area located near the southeast corner of the site. The eastern edge of the wetland was rutted during logging of the site. This disturbance causes water to stand in the area. Based on field observations, the wetland ends at the property boundary and does not continue off-site either as a wetland or confined drainage area; therefore, this area was determined to be a non-jurisdictional isolated wetland. The ACOE has the final determination regarding the jurisdictional status of this wetland. A summary table of vegetation within the wetland is below. Refer to Appendix A for the completed ACOE data form.

Species	Vernacular Name	Indicator Status
Acer rubrum	red maple	FAC
Scirpus cyperinus	wool-grass	OBL
Rubus argutus	serrate leaf blackberry	FACU
Smilax glauca	white greenbrier	FAC

FAC=Facultative; FACU = Facultative Upland; OBL = Obligate

Table 3
Summary of Wetland and Stream Characteristics

Wetland	Classification	Acreage
1	scrub-shrub	0.07
2	scrub-shrub	0.01
3	forested/scrub-shrub	0.76
4	emergent	0.06
5	emergent/scrub-shrub	0.62
Stream	**Classification**	**Substrate**
1	perennial	sand/gravel/bedrock
2	intermittent	sand/gravel
3	perennial	gravel/cobble/boulder/bedrock
4	intermittent	sand/gravel

Wetland 2

Wetland 2 is a small depressional area located along the southeast border of the site (Figure 7). The eastern edge of the wetland was rutted during logging of the site. This disturbance causes water to stand in the area. Based on field observations, the wetland ends at the property boundary and does not continue off-site either as a wetland or confined drainage area; therefore, this area was determined to be a non-jurisdictional isolated wetland. The ACOE has the final determination regarding the jurisdictional status of this wetland. A summary table of vegetation within the wetland is below. Refer to Appendix A for the completed ACOE data form.

Species	Vernacular Name	Indicator Status
Carex crinita	fringed sedge	FACW+
Juncus effusus	soft rush	FACW+
Ligustrum sinense	Chinese privet	FAC-

FACW=Facultative Wetland; FAC = Facultative

Wetland 3

Wetland 3 is located in a draw along the southeastern portion of the site. Trees dominate the lower end of the wetland whereas the upper end of the system tends to have a scrub-shrub community (Figures 7 and 8). The wetland continues outside of the study area. Surface saturation was present throughout the wetland. At the extreme eastern end of the wetland, a jurisdictional stream starts (this is located outside of the study area). A summary table of vegetation within the wetland is below. Refer to Appendix A for the completed ACOE data form.

Species	Vernacular Name	Indicator Status
Carex crinita	fringed sedge	FACW+
Scirpus cyperinus	wool-grass	OBL
Osmunda cinnamomea	cinnamon fern	FACW+
Acer rubrum	red maple	FAC
Juncus effusus	soft rush	FACW+
Pinus taeda	loblolly pine	FAC-
Alnus serrulata	tag alder	FACW+

FACW=Facultative Wetland; FAC = Facultative; OBL = Obligate

Wetland 4

Wetland 4 is a small depressional area located along the central portion of the site (Figure 8). The northern edge of the wetland was rutted during logging of the site. This disturbance causes water to stand in the area. Based on field observations, the wetland ends at a logging road and does not continue either as a wetland or confined drainage area; therefore, this area was determined to be a non-jurisdictional isolated wetland. The ACOE has the final determination regarding the jurisdictional status of this wetland. A summary table of vegetation within the wetland is below. Refer to Appendix A for the completed ACOE data form.

Species	Vernacular Name	Indicator Status
Carex crinita	fringed sedge	FACW+
Scirpus cyperinus	wool-grass	OBL
Rubus argutus	serrate leaf blackberry	FACU
Carex species	sedge	FAC+

FACW=Facultative Wetland; FAC = Facultative; FACU = Facultative Upland; OBL = Obligate

Wetland 5

Wetland 5 is located along the northwest property boundary (Figure 8). The wetland was clear-cut and is dominated by early successional species. A small wooded portion of the wetland is intact within the buffer of Yellow Creek. Surface saturation was present throughout the wetland. Stream 4 begins within Wetland 5. A summary table of vegetation within the wetland is below. Refer to Appendix A for the completed ACOE data form.

Species	Vernacular Name	Indicator Status
Juncus effusus	soft rush	FACW+
Scirpus cyperinus	wool-grass	OBL
Rubus argutus	serrate leaf blackberry	FACU
Smilax glauca	white greenbrier	FAC
Eupatorium capillifolium	dog fennel	FACU

FACW=Facultative Wetland; FAC = Facultative; FACU = Facultative Upland; OBL = Obligate

Stream 1

Stream 1 is a perennial stream that begins at a culvert under Adamsburg-Hillbridge Road. The stream does not extend above the road. The upper end of the stream is disturbed due to timbering of the property and run-off from the road (Figure 9). This section of the creek is 2 to 3 feet wide. Once it reaches the wood line along Yellow Creek, it becomes a bedrock stream with an average width of 3 to 5 feet. The stream flows directly to Yellow Creek.

Stream 2

Stream 2 is an intermittent tributary of Stream 1. The channel has an average width of 1 to 3 feet (Figure 10). Substrate was sand and gravel. The upper end of the drainage has a very dense growth of Chinese privet, an invasive exotic.

Stream 3

Stream 3 is Yellow creek (Figures 10 and 11). Yellow Creek is a perennial stream with an average width of 25 to 30 feet. After leaving the site, the creek joins Little River just above Little River Falls. The creek has a substrate of gravel, cobble, boulders, and bedrock.

Stream 4

Stream 4 is a small, 1-foot wide, intermittent stream that begins within Wetland 4 (Figure 12). The stream has a substrate of sand and gravel. As the stream nears Yellow Creek, it goes over a small ledge and then turns into a subterranean system.

SECTION 4
Permit Considerations

SECTION 4
Permit Considerations

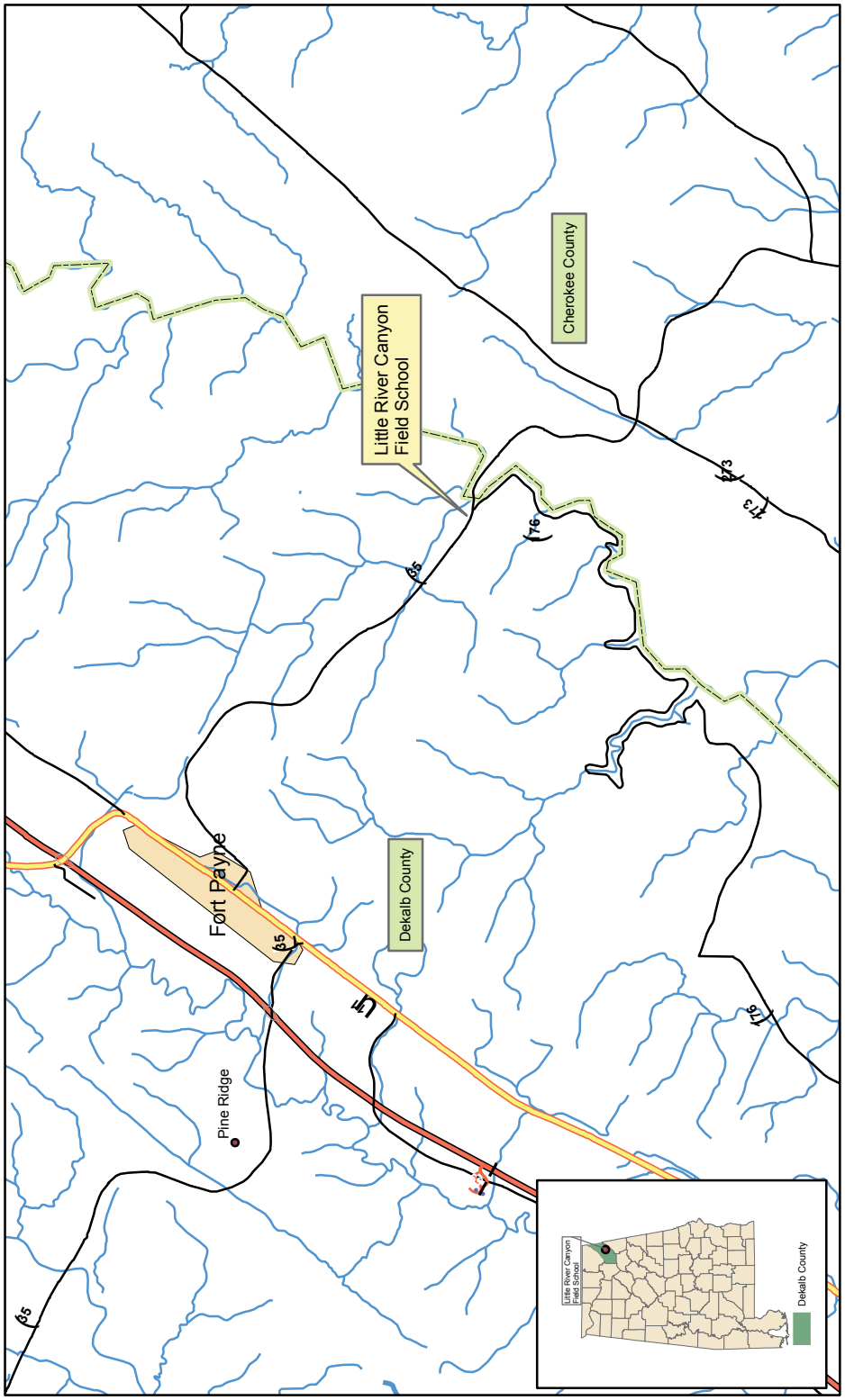
Section 404 Overview

Section 404 of the Clean Water Act provides the Secretary of the Army, acting through the Chief of Engineers, the power to issue Individual Permits and to authorize the use of Nationwide Permits (NWP) for the discharge of dredged or fill materials (i.e. impacts) into the waters of the United States, including special aquatic sites and wetlands (Nation's Waters). District engineers have the authority to issue permits for activities in the Nation's Waters.

For many of the NWPs, a Pre-Construction Notification (PCN) must be submitted to alert the local district office of the USACE of the intent to use a NWP. The PCN must describe the wetland system, provide specifications of the proposed project, identify the prospective permittee, include a mitigation plan, if required, and include a delineation of affected wetlands. The ACOE will request a review of the PCN by other resource agencies. Other resource agencies include USFWS, National Marine Fisheries Service (NMFS), U.S. Environmental Protection Agency (EPA), State Historic Preservation Office, and, in the State of Alabama, the Department of Environmental Management.

A concept layout has been developed for the site but detailed plans currently are not available. Should development of the site impact jurisdictional wetlands or streams, coordination with the ACOE will more than likely be required. Unavoidable impacts less than 0.5 acres of wetland or 300 linear feet of perennial stream should be eligible for a Nationwide Permit. More detailed permitting scenarios are dependent on final site plans.

FIGURES



Little River Canyon Field School
DeKalb County, AL
Location Map

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	USGS Topographic Map, Fort Payne, Alabama Quad	**Figure 1**

File name

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Aerial Photograph	**Figure 2**

File name

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Aerial Photograph	**Figure 3**

File name

General Conditions South Side

General Conditions North Side

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 4**

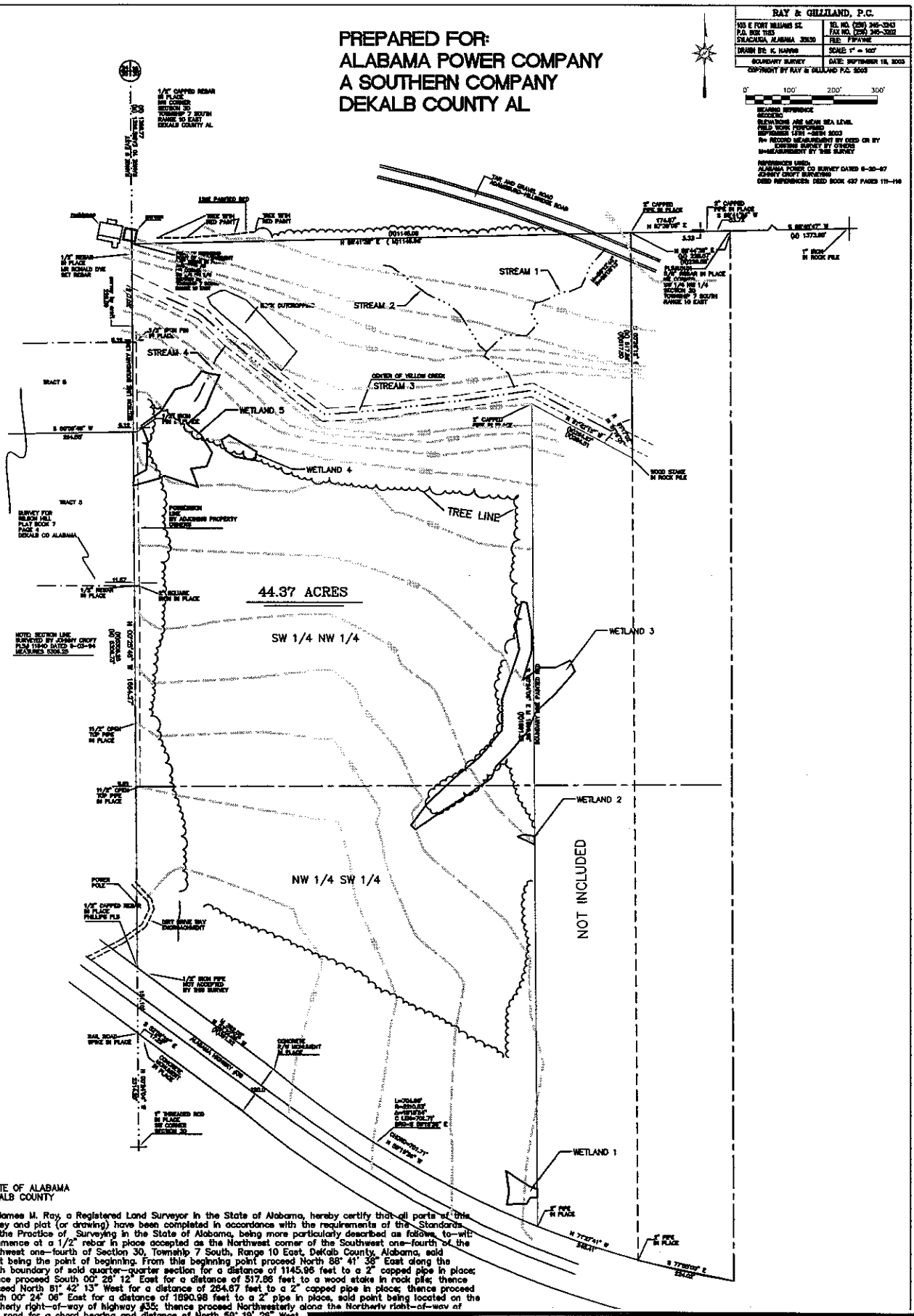
File name

Undisturbed Upland

Floodplain on North Side of Yellow Creek

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 5**

File name



STATE OF ALABAMA
DEKALB COUNTY

I, James M. Ray, a Registered Land Surveyor in the State of Alabama, hereby certify that all parts of this survey and plat (or drawing) have been completed in accordance with the requirements of the Standards for the Practice of Surveying in the State of Alabama, being more particularly described as follows, to-wit: Commence at a 1/2" rebar in place accepted as the Northwest corner of the Southwest one-fourth of the Northwest one-fourth of Section 30, Township 7 South, Range 10 East, DeKalb County, Alabama, said point being the point of beginning. From this beginning point proceed North 88° 41' 38" East along the North boundary of said quarter-quarter section for a distance of 1145.96 feet to a 2" capped pipe in place; thence proceed South 00° 26' 12" East for a distance of 517.86 feet to a wood stake in rock pile; thence proceed North 81° 42' 13" West for a distance of 264.67 feet to a 2" capped pipe in place; thence proceed South 00° 24' 06" East for a distance of 1890.98 feet to a 2" pipe in place, said point being located on the Northerly right-of-way of highway #35; thence proceed Northwesterly along the Northerly right-of-way of said road for a chord bearing and distance of North 59° 19' 28" West, [illegible] way monument in place; thence proceed North 53° 10' 34" West along t[illegible] road for a distance of 392.05 feet to a 1/2" capped rebar in place, so[illegible] boundary of the Northwest one-fourth of the Southwest one-fourth of [illegible] North 00° 25' 46" West along the West boundary of said Northwest one-[illegible] and the West boundary of the Southwest one-fourth of the Northwest [illegible] distance of 1654.27 feet to the point of beginning.

The above described land is located in the Southwest one-fourth of the Northwest one-fourth of the Southwest one-fourth of Section 30, Town[illegible] DeKalb County, Alabama, and contains 44.37 acres.

According to my survey this the 2nd day of October, 2003.

James M. Ray, Ala. Reg. No. 18383
Ray and Gilliland, P. C. Ala. Board Cert. No. CA-0114-LS

Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
Location of Wetlands and Streams	**Figure 6**

Wetland 2

Wetland 3

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 7**

File name

Wetland 3

Wetlands 4 and 5

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 8**

File name

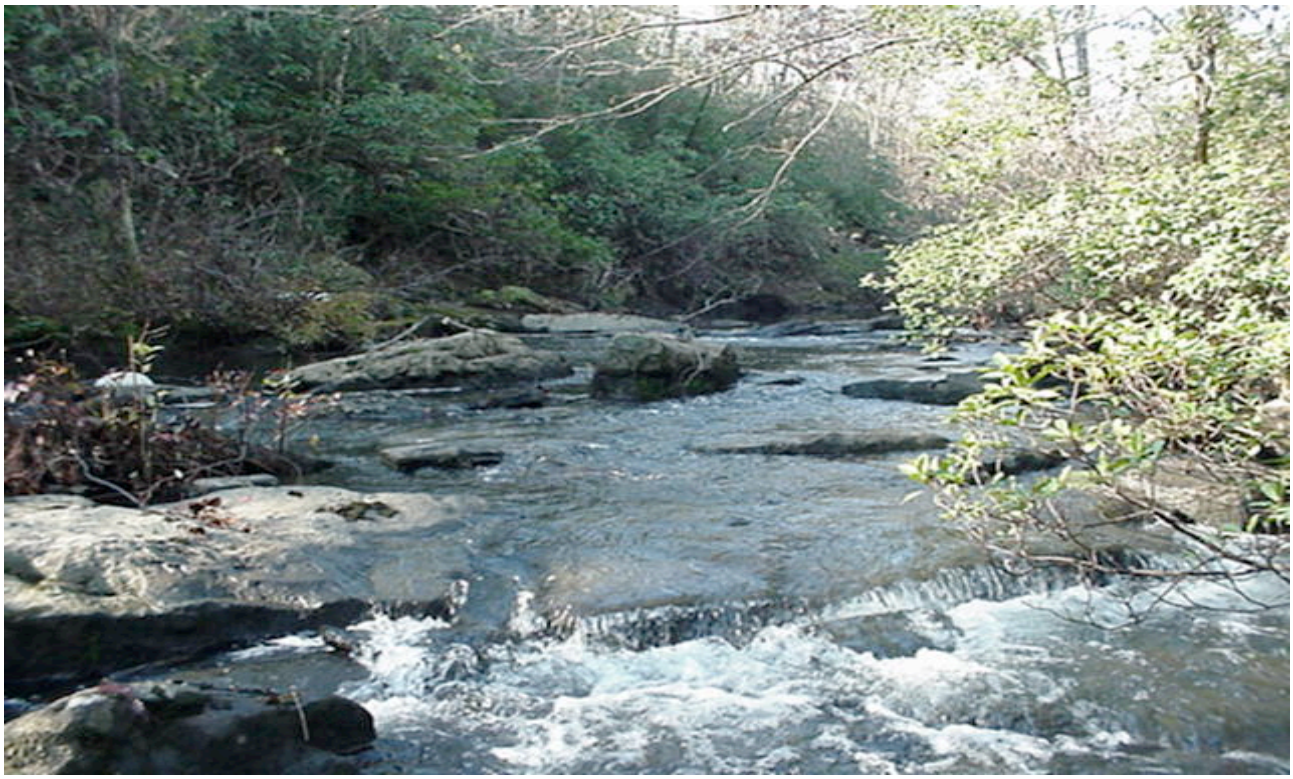
Stream 1

Stream 1

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 9**

File name

Stream 2



Stream 3

	Jacksonville Stte University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 10**

File name

Stream 3

Stream 3

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 11**

File name

Stream 4

Water 3

	Jacksonville State University Little River Canyon Field School	Date: December 2003 Scale: Not to Scale
	Site Photographs	**Figure 12**

File name

APPENDIX A
WETLAND DATA SHEETS

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

ject/Site:	Little River Canyon Field School			Date:	11/22/03
Applicant/Owner:	Jacksonville State University			County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard			State:	AL
Do normal circumstances exist on the site?	☒ Yes	☐ No		Community ID	PSS1B
Is the site significantly & recently disturbed? (Atypical Situation)	☐ Yes	☒ No		Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)	☐ Yes	☒ No		Plot ID	Wetland 1

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Acer rubrum*	red maple	Sapling	FAC
2.	*Scirpus cyperinus*	wool-grass	Herbaceous	OBL
3.	*Rubus argutus*	serrate leaf blackberry	Herbaceous	FACU
4.	*Smilax glauca*	White greenbrier	Vine	FAC
5.				
6.				
7.				
8.				
9.				
10.				
11.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 75

REMARKS: Small depressional area at the property boundary near Highway 35. Wetland/associated drainage features end at property boundary. Area rutted during logging. Based on field observations, it is isolated, non-jurisdictional.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☒ Saturated in Upper 12"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	2	(in)

SECONDARY Indicators

- ☐ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Depressional area. Water appears to stand due to previous disturbance associated with rutting during logging.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Field Observations
Taxonomy (Subgroup) _____ Confirm Mapped Type: Yes No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/1			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☒ Yes ☐ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No
Is this sampling point a Wetland?	☒ Yes	☐ No

REMARKS: Area meets three wetland parameters. However, drainage patterns are limited to the site. Neither the wetland nor the depression continues off site. Area determined to be an isolated, non-jurisdictional wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

ject/Site:	Little River Canyon Field School				Date:	11/22/03
Applicant/Owner:	Jacksonville State University				County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard				State:	AL
Do normal circumstances exist on the site?		☒	Yes	No	Community ID	PFO1B
Is the site significantly & recently disturbed? (Atypical Situation)			Yes ☒	No	Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)			Yes ☒	No	Plot ID	Wetland 2

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Carex crinita*	fringed sedge	Herbaceous	FACW+
2.	*Juncus effusus*	soft rush	Herbaceous	FACW+
3.	*Ligustrum sinense*	Chinese privet	shrub	FAC-
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 66%

REMARKS: Small depressional area at the property boundary. Wetland and associated drainage features end at property boundary. Area rutted during logging. Based on field observations, system is isolated, non-jurisdictional wetland.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☒ Saturated in Upper 12"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	4	(in)

SECONDARY Indicators

- ☒ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Depressional area. Water appears to stand due to previous disturbance associated with rutting during logging.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Field Observations

Taxonomy (Subgroup) _____ Confirm Mapped Type: Yes No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/1			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☒ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☒ Yes ☐ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No
Is this sampling point a Wetland?	☒ Yes	☐ No

REMARKS: Area meets three wetland parameters. However, drainage patterns are limited to the site. Neither the wetland nor the depression continues off site. Area determined to be an isolated, non-jurisdictional wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Little River Canyon Field School			Date:	11/22/03
Applicant/Owner:	Jacksonville State University			County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard			State:	AL
Do normal circumstances exist on the site?	☒ Yes		No	Community ID	PFO1B
Is the site significantly & recently disturbed? (Atypical Situation)	Yes	☒	No	Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)	Yes	☒	No	Plot ID	Wetland 3

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Carex crinita*	fringed sedge	Herbaceous	FACW+
2.	*Juncus effusus*	soft rush	Herbaceous	FACW+
3.	*Scirpus cyperinus*	wool-grass	Herbaceous	OBL
4.	*Osmunda cinnamomea*	cinnamon fern	Herbaceous	FACW+
5.	*Acer rubrum*	red maple	Tree	FAC
6.	*Pinus taeda*	loblolly pine	Tree	FAC
7.	*Alnus serrulata*	tag alder	Shrub	FACW+
8.				
9.				
10.				
11.				
12.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100

REMARKS: Area is a draw that was not timbered. Pines are growing on hummocks in the lower portion of the wetland. The upper end of the wetland is a scrub-shrub system with scattered trees. *Sphagnum* sp. throughout area.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☒ Saturated in Upper 12"
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	2	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	0	(in)

SECONDARY Indicators

- ☒ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Area was saturated throughout with up to 2 inches of standing water near property boundary.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Field Observations

Taxonomy (Subgroup) _____ Confirm Mapped Type: ☐ Yes ☐ No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/1			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☒ Yes ☐ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No
Is this sampling point a Wetland?	☒ Yes	☐ No

REMARKS: Area is the most intact wetland system on site.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

ject/Site:	Little River Canyon Field School				Date:	11/22/03
Applicant/Owner:	Jacksonville State University				County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard				State:	AL
Do normal circumstances exist on the site?		☒	Yes	No	Community ID	PEM1B
Is the site significantly & recently disturbed? (Atypical Situation)			Yes	☒ No	Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)			Yes	☒ No	Plot ID	Wetland 4

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Carex crinita*	fringed sedge	Herbaceous	FACW+
2.	*Scirpus cyperinus*	wool-grass	Herbaceous	OBL
3.	*Rubus argutus*	Chinese privet	Herbaceous	FAC-
4.	*Carex sp.*	Carex species	Herbaceous	FAC+
5.				
6.				
7.				
8.				
9.				
10.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100

REMARKS: Small depressional area at the property boundary. Wetland and associated drainage features end at logging road. Area rutted during logging. Based on field observations, system is isolated, non-jurisdictional wetland.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☒ Saturated in Upper 12"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	2	(in)

SECONDARY Indicators

- ☐ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

emarks: Depressional area. Water appears to stand due to previous disturbance associated with rutting during logging.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Taxonomy (Subgroup) _____ Field Observations
Confirm Mapped Type: Yes No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/1			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☒ Histic Epipedon
- ☒ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☒ High Organic Streaking in Surface Layer in Sandy Soils
- ☒ Organic Streaking in Sandy Soils
- ☒ Listed on Local Hydric Soils List
- ☒ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☒ Yes ☐ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No
Is this sampling point a Wetland?	☒ Yes	☐ No

REMARKS: Area meets three wetland parameters. However, drainage patterns are limited to the site. Neither the wetland nor the depression continues off site. Area determined to be an isolated, non-jurisdictional wetland.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Little River Canyon Field School			Date:	11/22/03
Applicant/Owner:	Jacksonville State University			County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard			State:	AL
Do normal circumstances exist on the site?	☒ Yes	☐ No		Community ID	PSS1B
Is the site significantly & recently disturbed? (Atypical Situation)	☐ Yes	☒ No		Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)	☐ Yes	☒ No		Plot ID	Wetland 5

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Juncus effusus*	soft rush	Herbaceous	FACW+
2.	*Scirpus cyperinus*	wool-grass	Herbaceous	OBL
3.	*Rubus argutus*	serrate leaf blackberry	Herbaceous	FACU+
4.	*Smilax glauca*	white greenbrier	Vine	FAC
5.	*Eupatorium capillifolium*	dog fennel	Herbaceous	FACU
6.				
7.				
8.				
9.				
10.				
11.				
12.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 80

REMARKS: Area was cut-over during logging of site. Primary dominants are *Rubus* and *Scirpus*.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☒ Saturated in Upper 12"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	2	(in)

SECONDARY Indicators

- ☐ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: Depressional area. Water 2 starts in the lower end of the wetland just above slope to Yellow Creek.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Field Observations
Taxonomy (Subgroup) _____ Confirm Mapped Type: Yes No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/1			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☒ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☒ Yes ☐ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No
Is this sampling point a Wetland?	☒ Yes	☐ No

REMARKS: Majority of wetland has been cut-over but a small portion in the wood line near Yellow Creek has an intact forested vegetation community.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Little River Canyon Field School				Date:	11/22/03
Applicant/Owner:	Jacksonville State University				County:	DeKalb
Investigators:	Terri Ballard/Mark Ballard				State:	AL
Do normal circumstances exist on the site?		☒ Yes		No	Community ID	Upland
Is the site significantly & recently disturbed? (Atypical Situation)		Yes	☒	No	Transect ID	
Is the area a potential Problem Area? (Explain in final remarks)		Yes	☒	No	Plot ID	Upland

VEGETATION

Dominant Plant Species:

	Scientific	Common	Stratum	Indicator
1.	*Solidago canadensis*	Canada goldenrod	Herbaceous	FACU
2.	*Dichanthelium dichotomum*	panic grass	Herbaceous	FAC
3.	*Rubus argutus*	serrate leaf blackberry	Herbaceous	FACU
4.	*Smilax glauca*	white greenbrier	Vine	FAC
5.	*Eupatorium capillifolium*	dog fennel	Herbaceous	FACU
6.	*Andropogon virgincus*	broom-sedge	Herbaceous	FAC-
7.				
8.				
9.				
10.				
11.				
12.				

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 33

REMARKS: Area was cut-over during logging of site approximately 2-3 years prior.

HYDROLOGY

RECORDED DATA (Describe in Remarks)

- ☐ Stream, Lake or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other
- ☐ None Available

PRIMARY Indicators

- ☐ Inundated
- ☐ Saturated in Upper 12"
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	0	(in)

SECONDARY Indicators

- ☐ Oxidized Root Channels in Upper 12"
- ☐ Water Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Remarks: No wetland hydrology present.

SOILS

Map Unit Name
(Series and Phase) _____ Drainage Class _____

Field Observations
Taxonomy (Subgroup) _____ Confirm Mapped Type: Yes No

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions,Structure,etc.
0-12		10YR4/4			Clay loam

HYDRIC SOIL INDICATORS

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Streaking in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks

Hydric Soils Present? ☐ Yes ☒ No

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☐ Yes	☒ No
Hydric Soils Present?	☐ Yes	☒ No
Is this sampling point a Wetland?	☐ Yes	☒ No

REMARKS:

SD60

November 3, 2003

To: Isaac Jones

From: Randy Silver

Subject: Technical evaluation of proposal received from Jacksonville State University

The proposal received from Jacksonville State University (JSU) for the construction of the Little River Field School has been thoroughly evaluated. We have reviewed the schedule, budget and approach of the proposal and found it acceptable. All other costs associated with this proposal have been evaluated as reasonable. This project was appropriated with a federal earmark and is of high interest to NASA and the State of Alabama. The NASA funds are contributing toward the overall cost of construction.

I request a grant be awarded to JSU to begin construction of this facility. The FY04 funding is still tentative but that It is likely that we may modify this award to include a one million increment during FY04. I will update at the earliest possible date when that decision is finalized.

This is one of the Earth Science Department's highest procurement priorities. Please award this at the earliest possible date. Please contact me If you have any questions.

Randy Silver
SD60/Business Management & Administrative Office
Global Hydrology and Climate Center

NASA/Marshall Space Flight Center, Marshall Space Flight Center, Alabama
Congressional Notification of Research Selection

Facility Grant Summary: The Little River Canyon Field School (LRCFS) will provide a wide range of programs primarily related to the earth sciences and the environment. The LRCFS plans to build an education /interpretive center to support education related to NASA's "Earth Science Enterprise", and the increasing success of its current programs and classes, have led to the need for this dedicated facility. This facility would include a reception/orientation area, permanent displays, a changing exhibit gallery, an A/V mini auditorium, laboratories, conference and meeting areas, office space, and community conference multi-use space.

Name of sponsoring NASA Program Office: MSFC Earth Science Department

Selectee	*Educational Grant Number*	*Potential Value*	*Performance period*
Jacksonville State University	TBD	**Phase I only - $1.9 Million NOTE: A future Phase II is planned if funding becomes available.**	**Construction complete by Oct. 1, 2006**
Congressional District Bud Cramer			
Full address **Environmental Policy and Information Center** **Suite 246, Martin Hall** **Jacksonville State University** **700 Pelham Rd N** **Jacksonville, AL 36265**			
Name of selectee's Principal Investigator **Mr W. Peter Conroy**			
Title of selected proposal **Little River Canyon Field School**			

APPENDIX B

Clean Air Act Analysis
for
Little River Canyon Field School

Purpose

The MSFC in Huntsville, Alabama, has opted to perform an informal air conformity applicability analysis to determine whether the construction of the LRCFS will comply with the U.S. EPA Final Conformity Rule, 40 CFR 93, Subpart B (for federal agencies), and 40 CFR 51, Subpart W (for state requirements) of the amended Clean Air Act (CAA).

Background

EPA has issued regulations clarifying the applicability of and procedures for ensuring that federal activities comply with the amended CAA. The EPA Final Conformity Rule implements Section 176(c) of the CAA, as amended in 42 U.S.C. 7506(c). This rule was published in the *Federal Register* on November 30, 1993, and took effect on January 31, 1994.

The EPA Final Conformity Rule requires all federal agencies to ensure that any federal action resulting in nonattainment criteria pollutant emissions conforms with an approved or promulgated State Implementation Plan (SIP) or Federal Implementation Plan (FIP).

Conformity means compliance with a SIP's/FIP's purpose of attaining or maintaining the NAAQS. Specifically, this means ensuring that the federal action will not:

1. Cause a new violation of the NAAQS.

2. Contribute to any increase in the frequency or severity of violations of existing NAAQS.

3. Delay the timely attainment of any NAAQS interim milestones, or other attainment milestones. NAAQS are established for six criteria pollutants: O_3, CO, PM equal to or less than 10 microns in diameter (PM_{10}) and 2.5 microns in diameter ($PM_{2.5}$), NO_2, SO_2, and Pb. The current standards apply to federal actions in NAAQS nonattainment or maintenance areas only.

Summary of Air Pollutant Emissions and Regulatory Standards

The proposed construction of the LRCFS would be implemented in DeKalb County, Alabama. On the basis of 2004 monitoring data, DeKalb County is designated as in attainment for all criteria pollutants.

General conformity is being addressed informally for the construction and operation of the LRCFS to gain a better understanding of the significance of the proposed action and how the proposed action will affect air quality. Air quality management in DeKalb County is under the jurisdiction of the ADEM, and EPA region 4. The applicable General Conformity regulation is 58 Federal Regulation (FR) 63214, November 30, 1993.

The EPA Final Conformity Rule requires that total direct and indirect emissions of nonattainment criteria pollutants, including ozone precursors VOCs and NOx, be considered in determining conformity. The rule does not apply to actions where the total direct and indirect emission of nonattainment criteria pollutants do not exceed threshold levels for criteria pollutants established in 40 CFR 93.135(b). Table 12 presents the *de minimis* threshold level of nonattainment areas.

Table 12. *De Minimis* threshold in nonattainment areas.

Pollutant	**Degree of Nonattainment**	**Level *De Minimisa*** **(tons/yr)**
O_3 (VOCs and NOx)	Moderate Serious Severe Extreme	100 50 25 10
VOCs	Marginal	50
NOx	Marginal	100
CO	All	100
PM	Moderate Serious	100 70
SO_2 or NO_2	All	100
Pb	All	25

Notes:
The number in bold reflects *de minimis* threshold used in this analysis.
NO_2 = Nitrogen dioxide.
NOx = Nitrogen oxides.
SO_2 = Sulfur dioxide.
VOC = Volatile organic compound
Source: ADEM, Air Division, Chapter 335-3-17-.02, General Conformity

In addition to meeting *de minimis* requirements, a federal action must not be considered a regionally significant action. A federal action is considered regionally significant when the total emissions from the action equal or exceed 10 percent of the air quality control area's emission budget for any criteria pollutant. If a federal action meets *de minimis* requirements and is not considered a regionally significant action, then it is exempt from further conformity analyses pursuant to 40 CFR 93.153(c).

Emission Modeling

Emissions were estimated using the U. S. Air Force ACAM. Specific emission factors, assumptions, and equations for area, mobile, and point sources are given in the ACAM technical documentation. Calculations have been established for each of the following categories of construction activity:

- Grading Equipment: Emissions in the grading phase are primarily associated with the exhaust from large earth-moving equipment.

  Tons/yr of VOCs = 0.22 (lbs/acre/day) x number of acres x days/yr of grading/2,000 lbs/ton
  Tons/yr of NOx = 2.07 (lbs/acre/day) x number of acres x days/yr of grading/2,000 lbs/ton
  Tons/yr of PM_{10} = 0.17 (lbs/acre/day) x number of acres x days/yr of grading/2,000 lbs/ton

- Asphalt Paving: VOC emissions in the asphalt paving phase are released through the evaporation of solvents contained in paving materials.

  Tons/yr of VOCs = (2.62 lbs/acre x number of acres paved)/2,000 lbs/ton

- Stationary Equipment: Emissions from stationary equipment occur when machinery such as generators, air compressors, welding machines, and other similar equipment are used at the construction site.

  Tons/yr of VOCs = gross ft^2 constructed x 0.198 x days/yr of construction/2,000 lbs/ton
  Tons/yr of NOx = gross ft^2 constructed x 0.137 x days/yr of construction/2,000 lbs/ton
  Tons/yr of PM_{10} = gross ft^2 constructed x 0.004 x days/yr of construction/2,000 lbs/ton

- Mobile Equipment: Mobile equipment includes forklifts, dump trucks, excavators, etc.

  Tons/yr of VOCs = gross ft^2 constructed x 0.17 x days/yr of construction/2,000 lbs/ton
  Tons/yr of NOx = gross ft^2 constructed x 1.86 x days/yr of construction/2,000 lbs/ton
  Tons/yr r of PM_{10} = gross ft^2 constructed x 0.15 x days/yr of construction/2,000 lbs/ton

- Architectural Coatings: VOCs are released through the evaporation of solvents that are contained in paints, varnishes, primers, and other surface coatings.

  Tons/yr of VOCs = (2.62 lbs/acre x number of acres paved)/2,000 lbs/ton

- Commuter Automobiles: Commuter traffic emissions are generated from commuter trips to and from the work site by construction employees.

  Number of worker trips = 0.42 (trips/ ft^2/day) x area of office (1,000 ft^2)
  Tons/yr of VOCs = 0.016 x number of worker trips x days/yr of construction/2,000 lbs/ton
  Tons/yr of NOx = 0.015 x number of worker trips x days/yr of construction/2,000 lbs/ton
  Tons/yr of PM10 = 0.0022 x number of worker trips x days/yr of construction/2,000 lbs/ton

Each project was divided into three stages: Grading, construction, and paving. It was assumed that the first 2.5 months of scheduled construction would be used for grading, 8 months would be used for construction, and the last 1.5 months would be used for paving. Calculations from ACAM were used to estimate the total emissions for each calendar year.

Tables and Emission Data

The emissions that would result from construction and implementation of the LRCFS are shown in table 13 and 14.

Table 13. Comparison of estimated annual emissions due to construction.

Pollutant	2004	2005	*De minimis* Level (tons/yr)
VOCs	0.273	1.372	50
NOx	1.538	0.331	100
PM_{10}	3.398	0.026	100
CO	4.222	1.020	100
SO_2	0.179	0.039	100

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

Table 14. Comparison of estimated annual emissions due to operations.

Pollutant	2006 and beyond	*De minimis* Level (tons/yr)
VOCs	0.058	50
NOx	0.055	100
PM_{10}	0.008	100
CO	0.956	100
SO_2	0.000000	100

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

Analysis

The total emissions resulting from the construction of the LRCFS from years 2005 to 2006 are illustrated in table 13. All emissions were calculated according to ACAM. The emission rates calculated for each calendar year fall below the *de minimis* level for each of the criteria pollutants analyzed.

As discussed above, a conformity analysis of federal actions must also demonstrate that the proposed action does not constitute a regionally significant action, which is defined as an action that contributes 10 percent or more of total basin-wide emissions. Had DeKalb County been in nonattainment status, Alabama would have developed an approved emissions budget to show eventual attainment, however, since the county is in attainment for all NAAQS, no federally approved emission budget exists. Consequently, there is currently no emissions budget for the purpose of conformity analysis for DeKalb County, Alabama. On the basis of emissions inventories for other basins, 10 percent of total emissions usually are several orders of magnitude below the *de minimis* levels. Therefore, because the emissions for the proposed action at LRCFS are below the *de minimis* levels, they also are expected to be several orders of magnitude below the regional significance criteria, and the proposed action would conform.

This conclusion is further supported by the fact that that the emissions for the proposed LRCFS during construction and operations phases are all small fractions of a percent of the current DeKalb County emission inventory, as shown in tables 15 and 16.

Table 15. Comparison of estimated emissions due to construction of LRCFS to DeKalb County emissions inventory.

	VOCs	NOx	PM_{10}	CO	SO_2
Emissions Inventory (tons/yr)	8,110	3,690	9,563	36,967	691
Percent of Inventory					
2005	0.034	0.042	0.036	0.011	0.026
2006	0.017	0.009	0.0003	0.003	0.006

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

Table 16. Comparison of estimated emissions due to operation of LRCFS to DeKalb County emissions inventory

	VOCs	NOx	PM10	CO	SO2
Emissions Inventory (tons/yr)	8,110	3,690	9,563	36,967	691
Percent of Inventory					
2006 and beyond	0.0007	0.002	0.0001	negligible	0

Notes:
NOx = Nitrogen oxides
VOC = Volatile organic compound
PM = Particulate matter
CO = Carbon monoxide
SO_2 = Sulfur dioxide

References

Conformity Guide, U.S. Air Force, August 1995.

Air Conformity Applicability Model, U.S. Air Force. April 2002.

U.S. Environmental Protection Agency: *Superfund Risk Assessment,* Rev. October 21, 2003. http://www.epa.gov/oerrpage/superfund/programs/risk/airmodel/johnson_ettinger.htm Accessed 2003.

U.S. Environmental Protection Agency: *Technology Transfer Network, Ozone Implementatio.* State/County Emission Summary for Alabama, Rev. July 31, 2002. http://www.epa.gov/ttn/naaqs/ozone/areas/state/cnty/alcy.htm Accessed September 9, 2003.

APPENDIX C
Archaeological Survey

AN ARCHAEOLOGICAL SURVEY OF THE JACKSONVILLE STATE UNIVERSITY LITTLE RIVER CANYON FIELD SCHOOL PROPERTY IN DEKALB COUNTY, ALABAMA

Archaeological Resource Laboratory
Jacksonville State University
May 2004

AN ARCHAEOLOGICAL SURVEY OF THE JACKSONVILLE STATE UNIVERSITY LITTLE RIVER CANYON FIELD SCHOOL PROPERTY IN DEKALB COUNTY, ALABAMA

by

John M. Noel, Gena Higginbotham,
and Chuck Burns
Jacksonville State University
Archaeological Resource Laboratory

Hunter Johnson
Principal Investigator

Submitted to the Jacksonville State University Environmental Policy and Information Center
May 2004

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AN ARCHAEOLOGICAL SURVEY OF THE JACKSONVILLE STATE UNIVERSITY LITTLE RIVER CANYON FIELD SCHOOL PROPERTY IN DEKALB COUNTY, ALABAMA

In November 2003, the Jacksonville State University (JSU) Archaeological Resource Laboratory (ARL) conducted a Phase I investigation of the future construction site for the proposed JSU Little River Canyon Field School Research Facility in DeKalb County, Alabama (Higginbotham et al. 2003). In addition, an inventory of archaeological sites on the property was conducted in conjunction with the Section 106 compliance survey. The inventory encompassed an additional 30 acres surrounding the proposed location of the research facility. The fieldwork was performed for the JSU Environmental Policy and Information Center (EPIC), directed by Mr. Pete Conroy. The projected location of the research center is found in the W 1/2 of Section 30, Township 7S, Range 10E as shown on the Fort Payne and Jamestown USGS 7.5 Minute Series Quadrangles (Figure 1). The entire area surveyed covers just over 44 acres. Chuck Burns and John Noel supervised the fieldwork under the direction of Principal Investigator, Hunter Johnson. Crewmembers assisting with the project were Josh Cordle, Corey Boling, Jeff Patterson, Brock Tyra, and Joey Williams. The fieldwork took place over seven days in November and December 2003.

Background Research

An examination of several sources was conducted in an attempt to locate previously recorded cultural resources, original landowners, and/or any historically significant information the area might possess. This investigation included queries to the Alabama State Site File (ASSF), the National Register of Historic Places (NRHP), the Alabama Register of Landmarks and Heritage (www.preserveala.org/alabamaregister.html), and the Bureau of Land Management (BLM) General Land Office (GLO) (www.glorecords.blm.gov).

The ASSF contained twelve entries for archaeological sites recorded within one mile of the project area (Figure 2). None of the previously recorded sites are located within the tract surveyed by the JSU-ARL (Shaw et al.1994). The NRHP contains 11 listings for Dekalb County and one listing for Cherokee County, however none of these were within the vicinity of the project area. The Alabama Register of Landmarks and Heritage includes 42 listings in Dekalb County. One of the listings, Edna Hill Methodist Church is near the project area (Figure 3). Finally, the BLM-GLO confirmed the transfer of six land titles to six individuals between 1847 and 1894 (Table 1).

Environmental Setting

The survey tract is located in the Lookout Mountain district of the Cumberland Plateau physiographic region (Figure 4). This area is characterized as a narrow, synclinal, sub-maturely

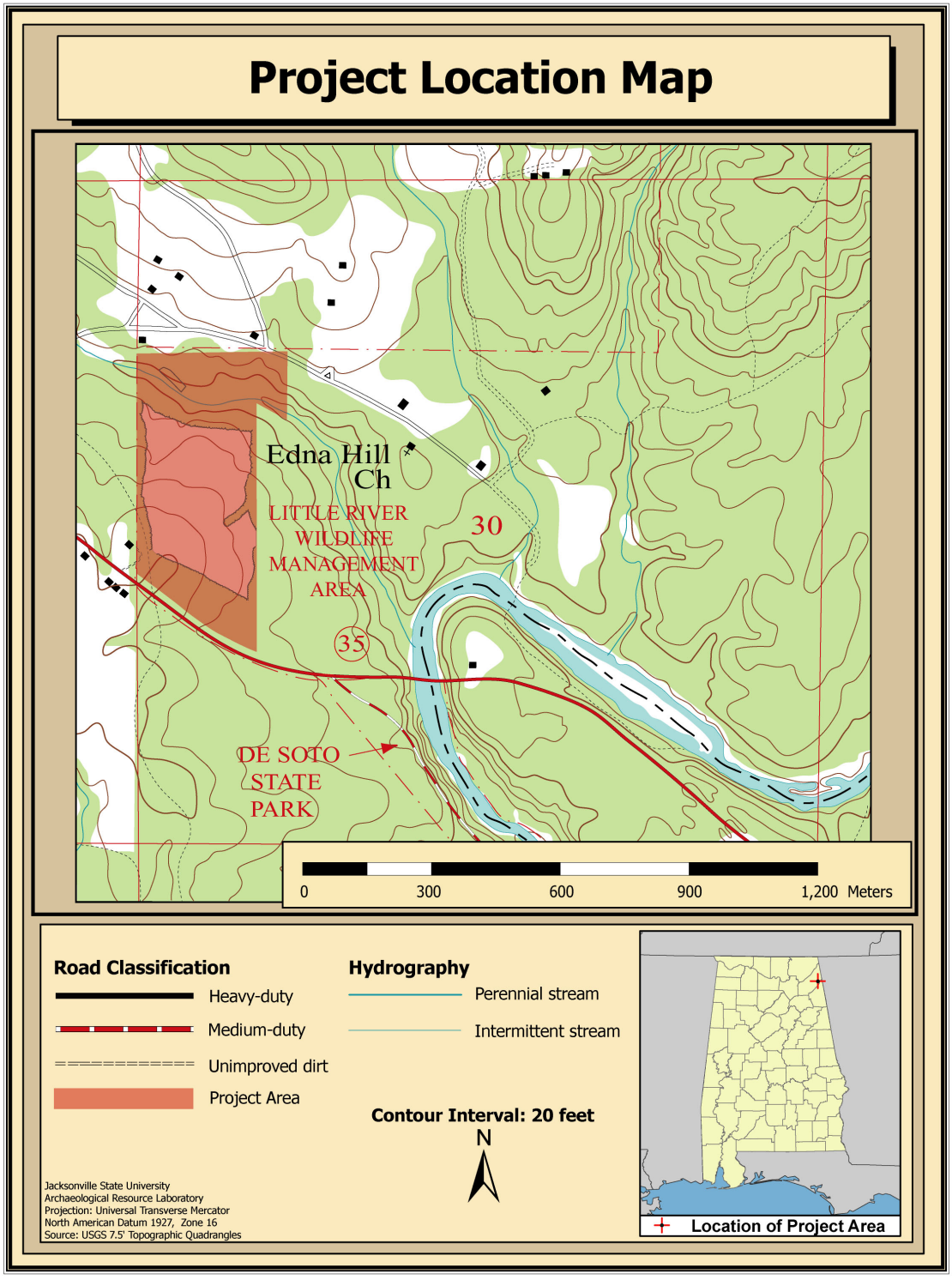


Figure 1. *Location of project area (base map photorevised 1970 USGS Fort Payne and photorevised 1984 USGS Jamestown, Alabama 7.5 minute series quadrangles).*

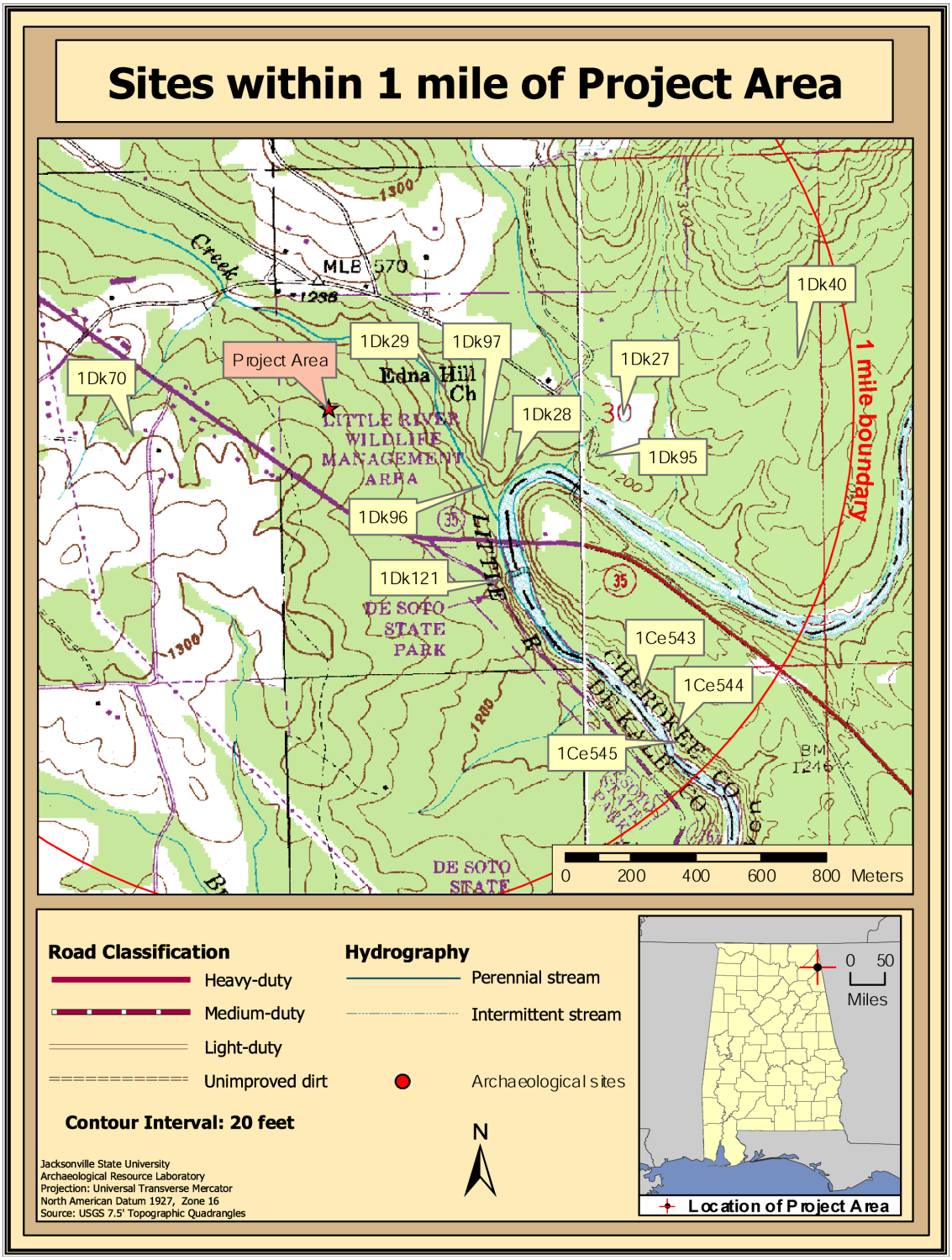


Figure 2. *Previously recorded sites within one mile of project area (base map photorevised 1970 USGS Fort Payne and photorevised 1984 USGS Jamestown, Alabama 7.5 minute series quadrangles).*

Figure 3. *Front view of Edna Hill methodist church.*

dissected, flat-topped remnant of the Cumberland Plateau (Sapp and Emplaincourt 1975). Soils occurring in this area consisted of seven types; Atkins silt loam, 0 to 2 percent slope; Crossville rocky loam, rolling phase, 5 to 10 percent slope; Hartsells fine sandy loam, rolling phase, 5 to 10 percent slope; Hartsells fine sandy loam, rolling shallow phase, 5 to 10 percent slope; Muskingum stony fine sandy loam, hilly phase, 10 to 20 percent slope; Muskingum stony fine sandy loam, rolling phase, 5 to 10 percent slope; Rockland, sandstone, rolling, 5 to 10 percent slope (Swenson et al. 1958). A typical shovel test excavated during Phase I testing was comprised of (10YR 3/3) silty loam over a yellowish brown (10YR 5/6) clay loam. The average depth of shovel tests ranged from 40 to 50 cm.

The project area is divided by Yellow Creek, a tributary to Little River. The confluence of these two channels is located approximately 400 m southeast of the forty-four acre survey tract.

The area has been clear cut within the last 5 to 10 years causing heavy erosion. Currently, the vegetation within the project area can be split up into two areas; these were various briars and grasses with pines and hardwoods closest to boundary lines and State Highway 35 (Figure 5), and thick mountain laurel with scattered patches of pines and hardwoods along the banks of Yellow Creek (Figure 6).

Field Methods

The intention of the survey was to locate and inventory cultural resources within the project area at the request of Little River Canyon Field School personel. This field work compliments earlier work conducted at the proposed construction area for a planned research facility (Higginbotham et al. 2003). The field survey employed two methods.

Individual	Description	Date of Issue
Thomas Baker	SESW T7S R10E S30	4/10/1847
Clarissa J Crane	NWNW T7S R10E S30	7/27/1891
James A Hill	NENW T7S R10E S30	6/21/1892
Johnathan N Mashan	NESW T7S R10E S30	5/1/1861
Hugh A Mcrae	W1/2SW T7S R10E S30	10/6/1894
Daniel K Rawlings	SENW T7S R10E S30	10/1/1845

Table 1. *Individuals with original issue land patents.*

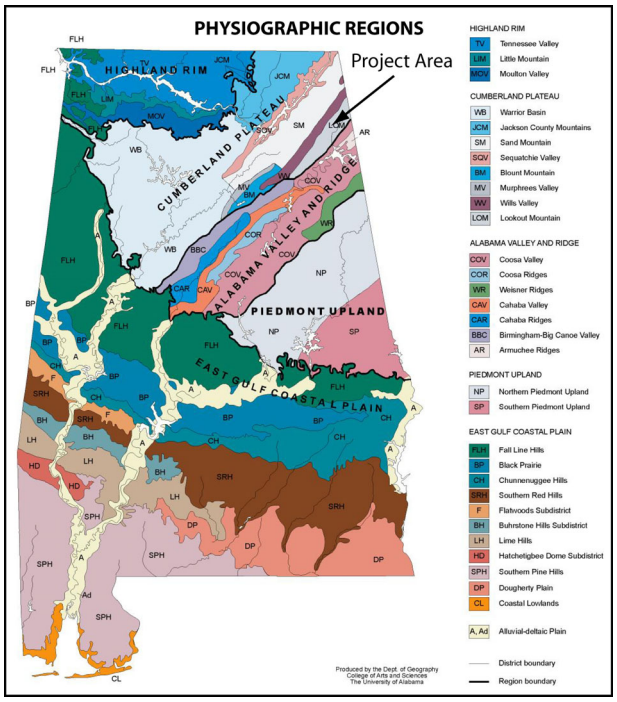


Figure 4. *Physiographic Regions of Alabama (www.alabamamaps.ua.edu).*

The first method consisted of excavating shovel tests on a 30-meter grid as well as surface inspection in areas that provided adequate surface visibility. The second method was a visual inspection of all stone outcroppings along Yellow Creek within the project area (Figure 7).

Shovel tests were cylindrical in shape, measured 30 cm in diameter, and were excavated until sterile deposits were encountered. Soils removed from tests were screened through 1/4-inch hardware mesh to ensure consistent artifact recovery. When positive shovel tests were encountered they were delineated in order to bound sites or isolated finds.

The procedure for open air site delineation was to establish a datum at a positive shovel test in the central portion of the site. Delineation tests were then put in at 15-m intervals from the datum in a cruciform pattern, example N, S, E, W, from datum. Delineation tests were excavated along these axes until two negative tests were encountered. Site boundaries were determined based upon positive tests and surface debris.

The methods used to identify and record rockshelters as sites included a visual inspection and surface collection, one shovel test if possible, a field sketch, and photography.

Figure 5. *View of vegetation occurring within project area, looking north.*

Figure 6. *View of Yellow Creek vegetation looking east.*

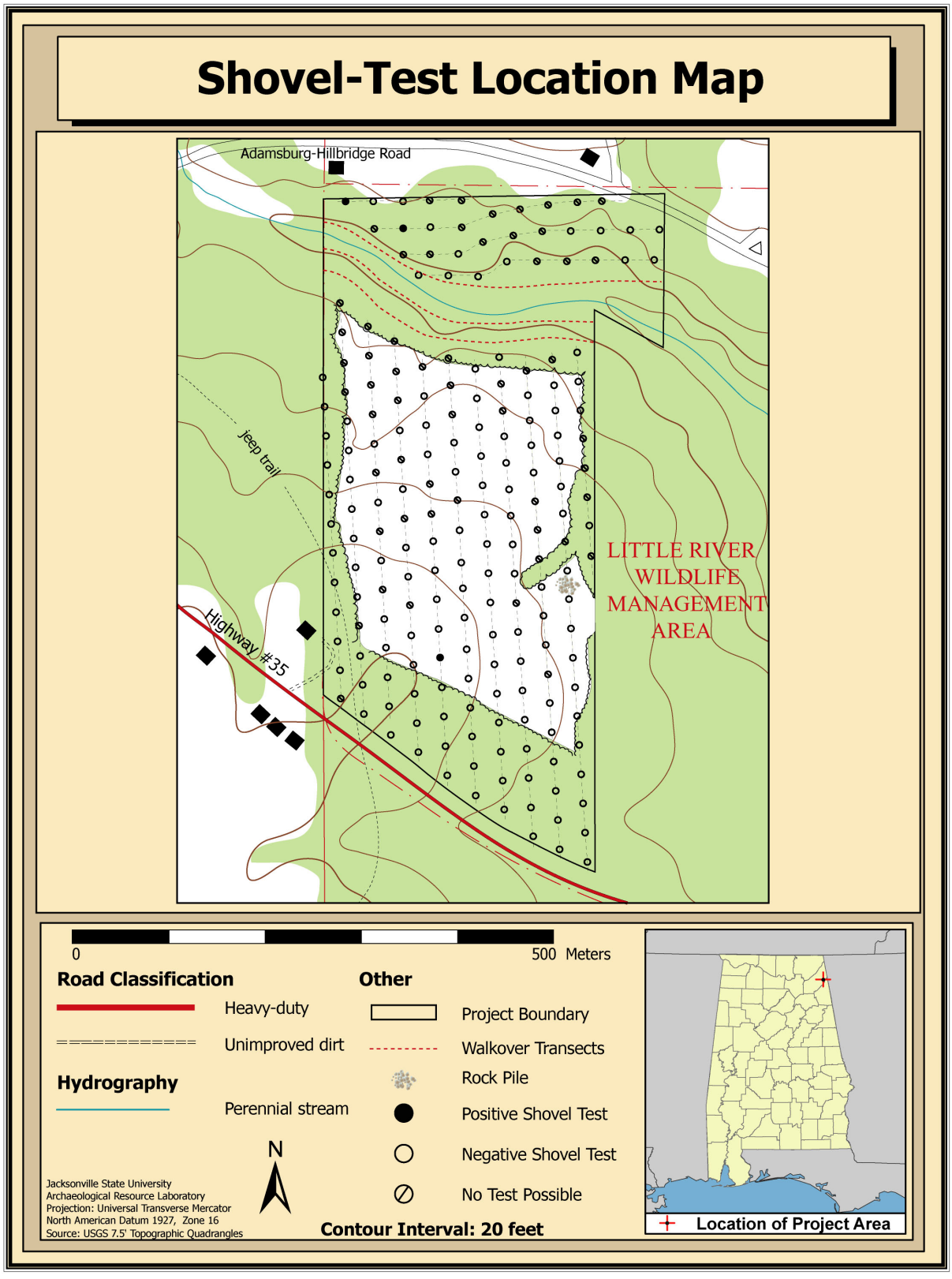


Figure 7. *Shovel test location and walkover transect map (base map photorevised 1970 USGS Fort Payne 7.5 minute series quadrangle).*

Survey Results

In November 2003 a Section 106 compliance report was submitted to the Alabama Historical Commission (AHC) detailing a survey conducted at the proposed construction site. No cultural resources were recorded during this initial survey, however one positive shovel test was recorded but inadvertantly left off the shovel test map. The artifact recovered from this shovel test consisted of one piece of whiteware. This area is discussed later under Isolated Find 1. Information on the initial 14 acres is being provided again so as to have a complete account of the cultural resources within the Little River Canyon Research Facility's landholding.

As a result of this investigation six locales yielded cultural material within the project area. In addition, a seventh locale was observed and recorded, just outside of the project area. Of these seven locales, four received official Alabama site numbers and were added to the state database (Figure 8). The remaining locales were not considered to be archaeological sites, but rather Isolated Finds, based on a paucity of cultural material recovered from each. The following is a discussion on each site recorded during the survey.

1Dk125

Site 1Dk125 was located on transect #9, along the eastern edge of the project area (Figure 8). This site consists of two small stone mounds which are a part of and encompassed by an oval ring of rocks. No artifacts were observed or recorded within the vicinity of these stone mounds. Origins of this surface feature are unknown (Figures 9 and 10). However, the unique nature of this feature warrants further documentation. In addition, stone mounds and walls believed to have been constructed by American Indians have been recorded throughout Northeast Alabama, Northwest Georgia, and East Tennessee (Holstein et al. 1995). Site 1Dk125 is considered potentially eligible for inclusion in the NRHP, as it represents a unique cultural resource.

1Dk124

Site 1Dk124 is located in the northwestern portion of the project area, in a sandstone rock formation overlooking Yellow Creek (Figure 8). This rockshelter faces south and is approximately 15 m north of Yellow Creek. The entire opening of this cavity measures 10 m wide, 1.5 m tall, and 3 m deep. The mouth of this cavity is divided into two sections (Figures 11 and 12). The opening to the east has a rock floor while the one to the west has a dirt floor. One shovel test was excavated to bedrock in the western entrance, to a depth of 20 cm. This test was negative, however six pieces of chipped-stone debitage were recovered through surface inspection. Site 1Dk124 is considered potentially eligible for inclusion in the NRHP as rockshelters have potential to contain intact and well preserved cultural remains. However further testing would be neccessary to ascertain its significance.

1Dk126

Site 1Dk126 is located approximately 30-m southeast of site 1Dk124, within the same rock

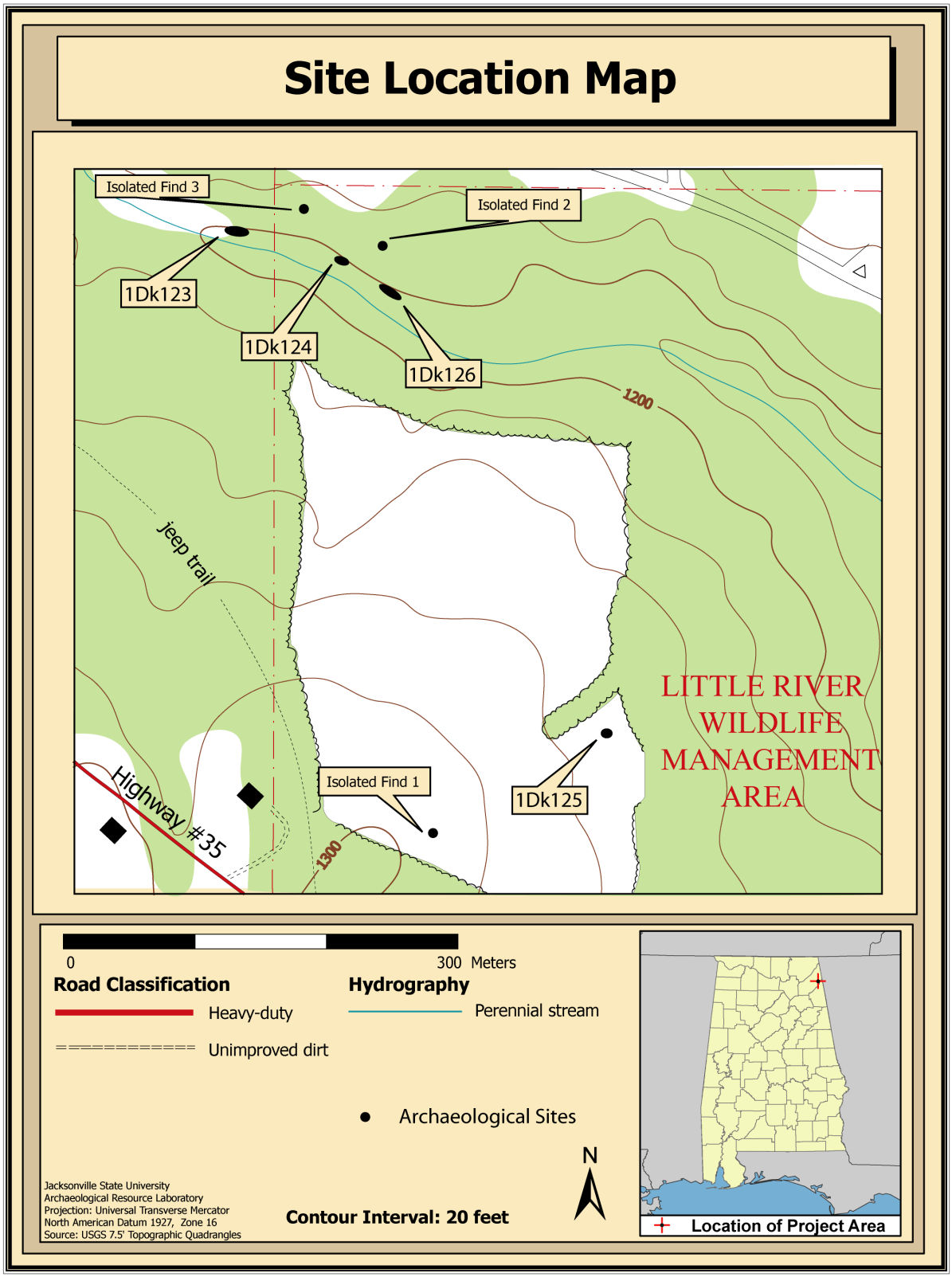


Figure 8. *Site location map (base map photorevised 1970 USGS Fort Payne 7.5 minute series quadrangle).*

Figure 9. *Stone mound at 1Dk125, located within project area.*

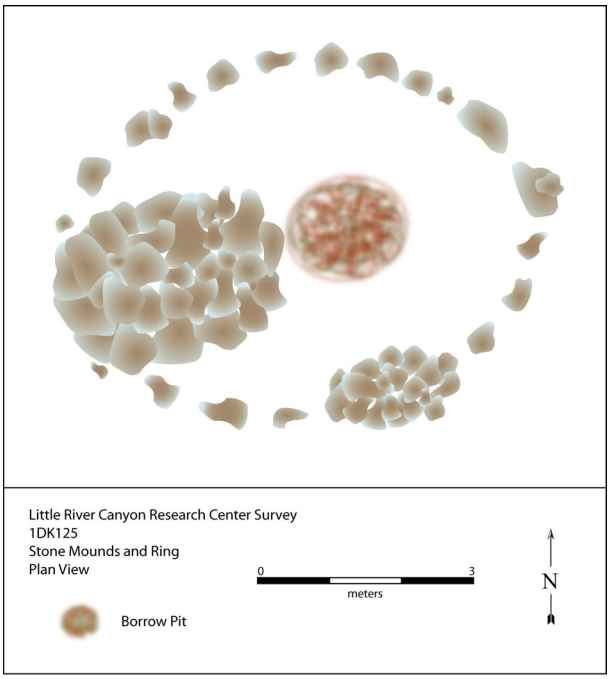


Figure 10. *Illustration of stone mounds, stone ring, and borrow pit at 1Dk125.*

formation, and is approximately 15 m from Yellow Creek (Figure 8). This rockshelter consists of four openings or cavities, all facing south.

Cavity #1 measures 2.1 m at the tallest point, 5 m wide, and 5 m deep (Figure 13 and 14). One shovel test was excavated within Cavity #1 to a depth of 20 cm at which point bedrock was encountered. The shovel test was negative, however one piece of chert debitage and several pieces of mason jar fragments were observed and collected through surface inspection.

Cavity #2 is located just to the east of cavity #1 and measures 56 cm tall, 3.6 m wide, and 1 m in

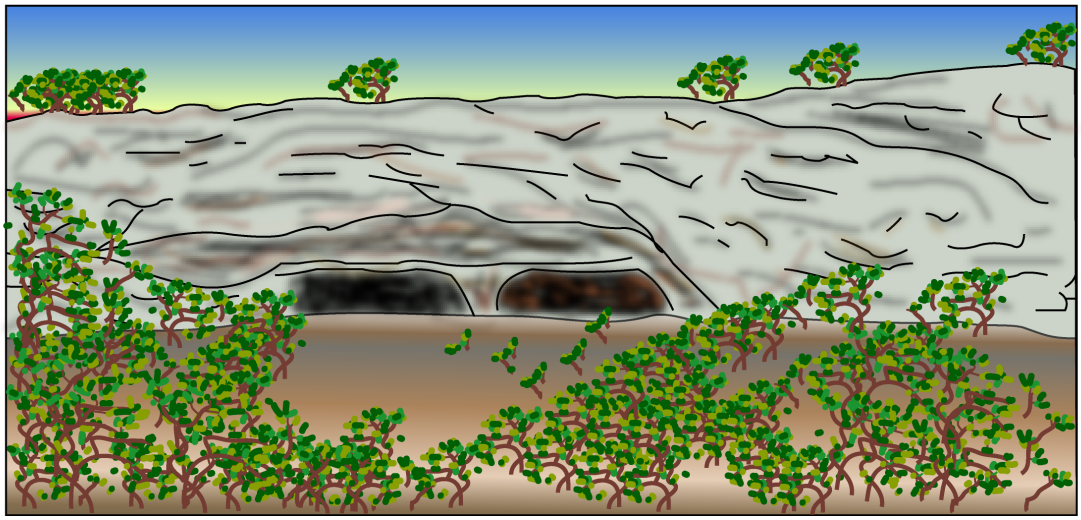


Figure 11. *Artists rendering of rockshelter, Site1Dk124.*

Figure 12. *View of western entrance at 1Dk124, looking north.*

depth. No shovel tests were excavated in this cavity, due to the limited overhead space.

Cavity #3 is located beneath Cavity #1 and measures 1 m tall, 42 cm wide, and 3 m deep. No shovel tests were placed in this cavity as it is filled with alluvial sand that overlay the shelter floor.

Cavity #4 is located east of Cavity #3, and beneath Cavity #2, it measures 70 cm tall, 2.7 m wide, and 180 cm deep. The floor of this cavity is also filled with alluvial sand. Both Cavity #3 and Cavity #4 appear to have been one large cavity which has slumped in, separating the two.

Only one piece of debitage was recovered and collected from this cluster of cavities. However, mason jar fragments suggest more recent activities in the shelter centered around moonshining. Site 1Dk126 is considered potentially eligible for the NRHP, due to its configuration and size, which are condusive to human habitation. Further testing is necessary to ascertain the sites significance.

Isolated Find #1

Isolated Find #1 is located in the southwestern portion of the project area (see Figure 8). This isolated find consisted of one piece of whiteware. Five delineation tests were placed in a cruciform pattern from the positive shovel test, all of which were negative. A visual inspection of exposed ground in the area produced no other artifacts or surface

Figure 13*. View from inside Cavity #1 at 1Dk126, looking south.*

Figure 14. *View of Cavity #1 at 1Dk126, looking North.*

features. Due to a paucity of artifacts, this area was not assigned a state site number.

Isolated Find #2

Isolated Find #2 is located in the northwestern portion of the project area (see Figure 8). This isolated find consisted of two pieces of whiteware and one rubber tip (for a walking cane) all of which came from the same shovel test. In addition, one piece of debitage from a delineation test. Seven delineation tests were placed in a cruciform pattern around both the historic and prehistoric find. No other positive tests were encountered, however several modern/historic trash piles were observed adjacent to Isolated Find #2 along the edge of the project area bordering residential areas (Figure 15). Due to a paucity of subsurface artifacts, limited depth of recovery, and the likely association with modern/historic trash piles in the vicinity, Isolated Find #2 was not assigned a state site number.

Isolated Find #3

Isolated Find #3 is also located in the northwestern portion of the project area (see Figure 8). This isolated find consisted of one piece of clear container glass. This find however was not delineated as it was on the the edge of the project area. Furthermore, material recovered from the shovel test is most likely associated with trash piles along the northern boundary of the project area. Due to a paucity of subsurface artifacts, limited depth of recovery, and the likely association with modern/historic trash piles in the vicinity, this area was not assigned a state site number.

Also of note, several small rockshelters were located on the south side of Yellow Creek. These rockshelters were investigated through exploritory shovel testing and visual inspection for evidence of human occupation; however, no artifacts were recovered from these areas.

Additionally, a third rockshelter 1Dk123 was located. Although this site is located just outside of the project area, a short description follows.

Figure 15. *Trash pile along northern edge of project area.*

1Dk123

Site 1Dk123 is located approximately 20 m southwest of the northwestern corner of the project area (see Figure 8). This rockshelter faces south and is approximately 5 to 7 m north of Yellow Creek (Figure 16). One stemmed hafted biface fragment, one biface fragment, and four flakes were recovered from this shelter through surface inspection. Given its size, setting and evidence of human occupation site 1Dk123 is considered potentially eligible for the NRHP. Such rockshelters have potential to contain intact and well preserved cultural remains, however further testing would be neccessary to ascertain its significance.

Figure 16. *View of crewmember inside of 1Dk123, looking north.*

Summary and Recommendations

In November 2003, the JSU-ARL conducted an archaeological survey of the future location for the Jacksonville State University Little River Canyon Field School Research Facility and surrounding property for the Environmental Policy and Information Center. The survey included the excavation of 142 shovel tests, 12 delineation tests, and a visual inspection of sandstone outcroppings along Yellow Creek that might contain rockshelters suitable for American Indian habitation. The field investigation resulted in the recording of three American Indian sites (1Dk123, 1Dk124, and 1Dk126), and one site with an unknown component (1Dk125), all of which potentially contain culturally significant resources and therefore are considered potentially eligible for inclusion in the NRHP. Also, three isolated finds were recorded, none of which yielded sufficient artifacts for inclusion in the Alabama State Site Files, or for listing on the NRHP.

As no sites were located inside the footprint of the proposed Little River Canyon Research Center Facility, and since it has been agreed that both the rockshelters and the stone mounds found on the property will be incorporated as teaching tools in conjunction with Little River Canyon Research Facility programs, it is the recommendation of the JSU-ARL that no further investigation is warranted at this time. Sites 1Dk125, 1Dk124, and 1Dk126 are all considered potentially eligible for listing on the NRHP and should be preserved. In addition site 1Dk123, while outside of the project area, is also considered potentially eligible for listing on the NRHP.

Acknowledgements

Thanks goes to Daniel Brooks, and Jamie Dickeson for generating the maps used in this report. Also to Mr. Pete Conroy, Mr. John Bundy and Mr. Larry Beane for their assistance and cooperation.

References

Higginbotham, Gena, John M. Noel, and Chuck Burns
2003 *An Archaeological Survey of the Future Location for the Little River Canyon Field School Research Facility in Dekalb County, Alabama.* Jacksonville State University. Archaeological Resource Laboratory.

Holstein, O. Harry, Curtis E. Hill, and Keith J. Little
1995 *Archaeological Investigation of Stone Mounds on the Fort McClellan Military Reservation Calhoun County, Alabama.* Jacksonville State University. Archaeological Resource Laboratory.

Sapp, C. Daniel, and Jacques Emplaincourt
1975 *Physiographic Regions of Alabama.* State of Alabama Geological Survey Map 168.

Shaw, Scott
1994 *Cultural Resource Investigations in The Little River Canyon Area, Dekalb and Cherokee Counties, Alabama.*University of Alabama. Alabama Museum of Natural History. Division of Archaeology, Moundville, Alabama.

Swenson, G.A., S.R. Bacon, R. S. Farnham, and J. E. Paseur
1958 *Soil Survey of DeKalb County, Alabama.* U.S. Department of Agriculture Soil Conservation Service Series 1951(3).

APPENDIX A:
MATERIAL RECOVERED

Material Recovered	1Dk123	Count	Weight	Accession
surface collection				
	chert stemmed hafted biface	1	6.5	1Dk123/6/1
	chert biface fragment	1	2.2	1Dk123/6/2
	debitage (1/2-inch undifferentiated chert with cortex)	2	3.5	1Dk123/6/3-4
	debitage (1/2-inch undifferentiated chert without cortex)	2	4.0	1Dk123/6/5-6

Material Recovered	1Dk124	Count	Weight	Accession
surface collection				
	debitage (<1/4-inch undifferentiated chert with cortex)	1		1Dk124/7/1
	debitage (1/2-inch undifferentiated chert without cortex)	1	2.3	1Dk124/7/3
	debitage (1/4-inch undifferentiated chert with cortex)	1	0.3	1Dk124/7/2
	debitage (1/4-inch undifferentiated chert without cortex)	3	0.8	1Dk124/7/4-6

Material Recovered	1Dk126	Count	Weight	Accession
surface collection				
	debitage (1/2-inch undifferentiated chert without cortex)	1	1.0	1Dk126/5/8
	glass (clear)	5	21.5	1Dk126/5/3-7
	glass (clear with threaded finish)	2	72.6	1Dk126/5/1-2

Material Recovered	IF1	Count	Weight	Accession
ST 10 TR 4/10-20 cmbs				
	undecorated whiteware	1	4.8	IF1/1/1

Material Recovered	IF2	Count	Weight	Accession
15 meters West of ST 2 TR 14				
	debitage (1/2-inch undifferentiated chert with cortex)	1	1.7	IF2/3/1
	unmodified undifferentiated stone	1	1.3	IF2/3/2
ST 2 TR 14				
	handpainted whiteware	1	0.5	IF2/2/2
	undecorated whiteware	1	4.4	IF2/2/1
	rubber tip	1	6.3	IF2/2/3
surface collection				
	undecorated whiteware	1	3.9	IF2/4/6
	glass (brown with threaded finish)	1	48.4	IF2/4/1
	glass (clear)	2	56.1	IF2/4/4-5
	glass (cobalt blue)	1	17.3	IF2/4/2
	glass (milk)	1	27.9	IF2/4/3

Material Recovered	IF3	Count	Weight	Accession
ST 1 TR 16/0-5 cmbs				
	glass (clear)	1		IF3/8/1

APPENDIX B:
SITE FORMS

Site: DK123 Retrieve Site

Site Name: UNNAMED

Location and Size

Easting: 625431 Northing: 3807425 Elevation: 1203

Township: 07S Range: 09E Section: 25

NE 1/4 of SE 1/4 of NE 1/4

Major Axis: 25 Minor Axis: 7 Max Depth: 0

Location and Size

Preservation State: UNMODIFIED

Immediate Destruction Pending: N Looting/Vandalism: ? % Destroyed: 0

National Register Status: UNDE

Archaeological Information

Level of Investigation: VOLUNTEERED

Excavation Status: SURFACE COLLECTION

Topographic Association: UPLAND SLOPE

Physiographic District: LOOKOUT

Physiographic Section: CUMBERLAND

Nearest Water Source: THIRD

Direction To: S Distance To: 7 At Confluence: N

Drainage Basin: COOSA

Ground Cover: UNIMPROVED

Soil Type: MUSKINGUM

Soil Texture Class: FINE SANDY LOAM

County Soil Survey:

Degree of Disturbance: ?

Characteristics

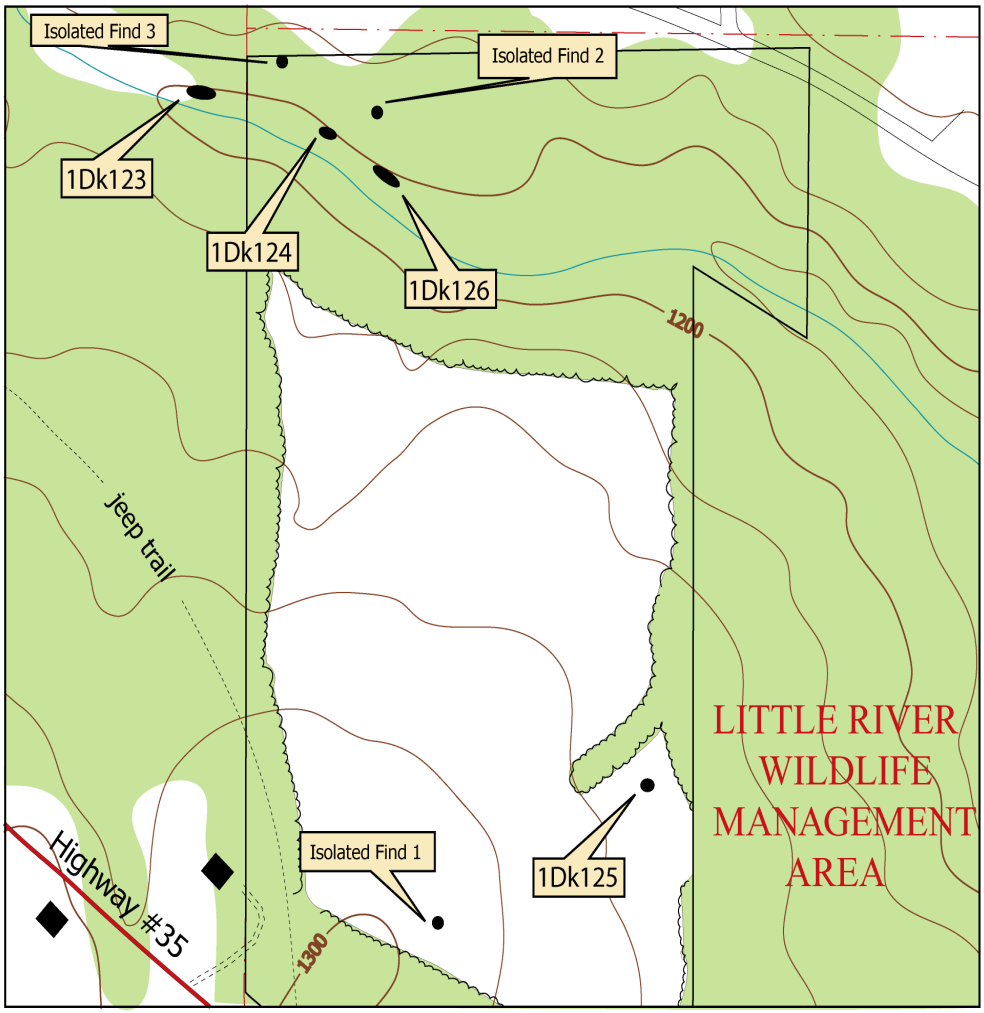
☐ Human Remains	☐ Stone Mound(s)
☐ Features	☐ Weir
☐ Petroglyph/Pictrograph	☐ Quarry
☑ Rockshelter	☐ Standing Historic Structure
☐ Cave	☐ Historic Structure Site
☑ Artifact Scatter	☐ Historic Cemetery
☐ Midden	☐ Still
☐ Shell Midden	☐ Mill
☐ Single Earthen Mound	☐ Engineering
☐ Multiple Earthen Mound	☐ Other

Components

UNKNOWN ABORIGINAL

Comments

1DK123 WAS RECORDED BY JOHN NOEL AND CHUCK BURNS, JACKSONVILLE, AL. THE SITE CONSISTS OF A MEDIUM SIZED BLUFF SHELTER APPROXIMATELY 7 TO 10 METERS NORTH OF YELLOW CREEK. THE SHELTER APPEARS TO REMAIN INTACT. ONE STEMMED HAFTED BIFACE FRAGMENT, ONE BIFACE FRAGMENT, AND FOUR PIECES OF DEBITAGE WERE RECOVERED THROUGH SURFACE INSPECTION. NO SHERDS WERE OBSERVED.



Record Type: ☑ Clear ☐ Master ☐ Synonym

Form Status: ☐ Final ☐ Verified ☑ New

Form Completion: ☐ Final ☐ Map Search ☐ Literature Search

Sponsor Type:	ACA	Sponsored By:	JSU
Recorder Type:	ACA	Recorded By:	JSU
Date Submitted:	2003-12-08	Date Revised:	2003-12-09

Site: DK124 Retrieve Site

Site Name: UNNAMED

Location and Size

Easting: 625509 Northing: 3807409 Elevation: 1265

Township: 07S Range: 10E Section: 30

NW 1/4 of SW 1/4 of NW 1/4

Major Axis: 10 Minor Axis: 3 Max Depth: 0

Location and Size

Preservation State: UNMODIFIED

Immediate Destruction Pending: N Looting/Vandalism: N % Destroyed: 0

National Register Status: UNDE

Archaeological Information

Level of Investigation: RECONNAISSANCE

Excavation Status: SURFACE & SHOVEL

Topographic Association: UPLAND SLOPE

Physiographic District: LOOKOUT

Physiographic Section: CUMBERLAND

Nearest Water Source: THIRD

Direction To: S Distance To: 10 At Confluence: N

Drainage Basin: COOSA

Ground Cover: UNIMPROVED

Soil Type: MUSKINGUM

Soil Texture Class: FINE SANDY LOAM

County Soil Survey:

Degree of Disturbance: UNDISTURBED

Characteristics

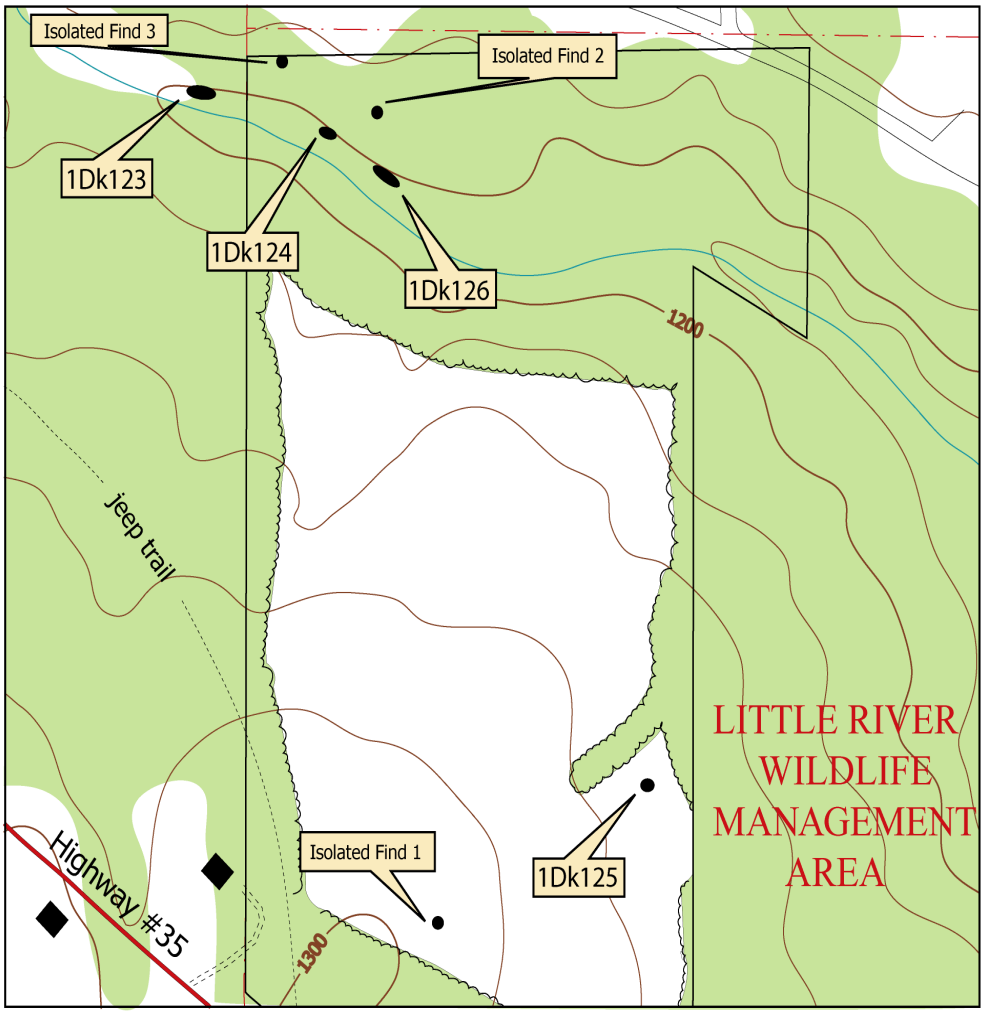
☐ Human Remains	☐ Stone Mound(s)
☐ Features	☐ Weir
☐ Petroglyph/Pictrograph	☐ Quarry
☑ Rockshelter	☐ Standing Historic Structure
☐ Cave	☐ Historic Structure Site
☑ Artifact Scatter	☐ Historic Cemetery
☐ Midden	☐ Still
☐ Shell Midden	☐ Mill
☐ Single Earthen Mound	☐ Engineering
☐ Multiple Earthen Mound	☐ Other

Components

UNKNOWN ABORIGINAL

Comments

1DK124 WAS RECORDED BY JOHN NOEL AND CHUCK BURNS, JACKSONVILLE, AL. THE SITE CONSISTS OF A MEDIUM SIZED BLUFF SHELTER LOCATED 7 TO 10 METERS NORTH OF YELLOW CREEK. THE SHELTER APPEARS TO REMAIN INTACT. ONE SHOVEL TEST WAS EXCAVATED IN THIS SHELTER (APPROX. DEPTH 20CM); NO CULTURAL MATERIAL WAS RECOVERED FROM THIS TEST. HOWEVER FIVE FLAKES WERE RECOVERED THROUGH SURFACE COLLECTION. NO SHERDS WERE OBSERVED.



Record Type: ☑ Clear ☐ Master ☐ Synonym

Form Status: ☐ Final ☐ Verified ☑ New

Form Completion: ☐ Final ☐ Map Search ☐ Literature Search

Sponsor Type: ACA Sponsored By: JSU

Recorder Type: ACA Recorded By: JSU

Date Submitted: 2003-12-08 Date Revised: 2003-12-09

Site: DK125 Retrieve Site

Site Name: UNNAMED

Location and Size

Easting: 625714 Northing: 3807064 Elevation: 1250

Township: 07S Range: 10E Section: 30

NW 1/4 of NW 1/4 of SW 1/4

Major Axis: 7 Minor Axis: 5 Max Depth: 0

Location and Size

Preservation State: LOOTING

Immediate Destruction Pending: N Looting/Vandalism: Y % Destroyed: 10

National Register Status: UNDE

Archaeological Information

Level of Investigation: RECONNAISSANCE

Excavation Status: NO COLLECTION

Topographic Association: UPLAND SLOPE

Physiographic District: LOOKOUT

Physiographic Section: CUMBERLAND

Nearest Water Source: THIRD

Direction To: E Distance To: 260 At Confluence: N

Drainage Basin: COOSA

Ground Cover: SECONDARY

Soil Type: HARTSELLS

Soil Texture Class: FINE SANDY LOAM

County Soil Survey:

Degree of Disturbance: ?

Characteristics

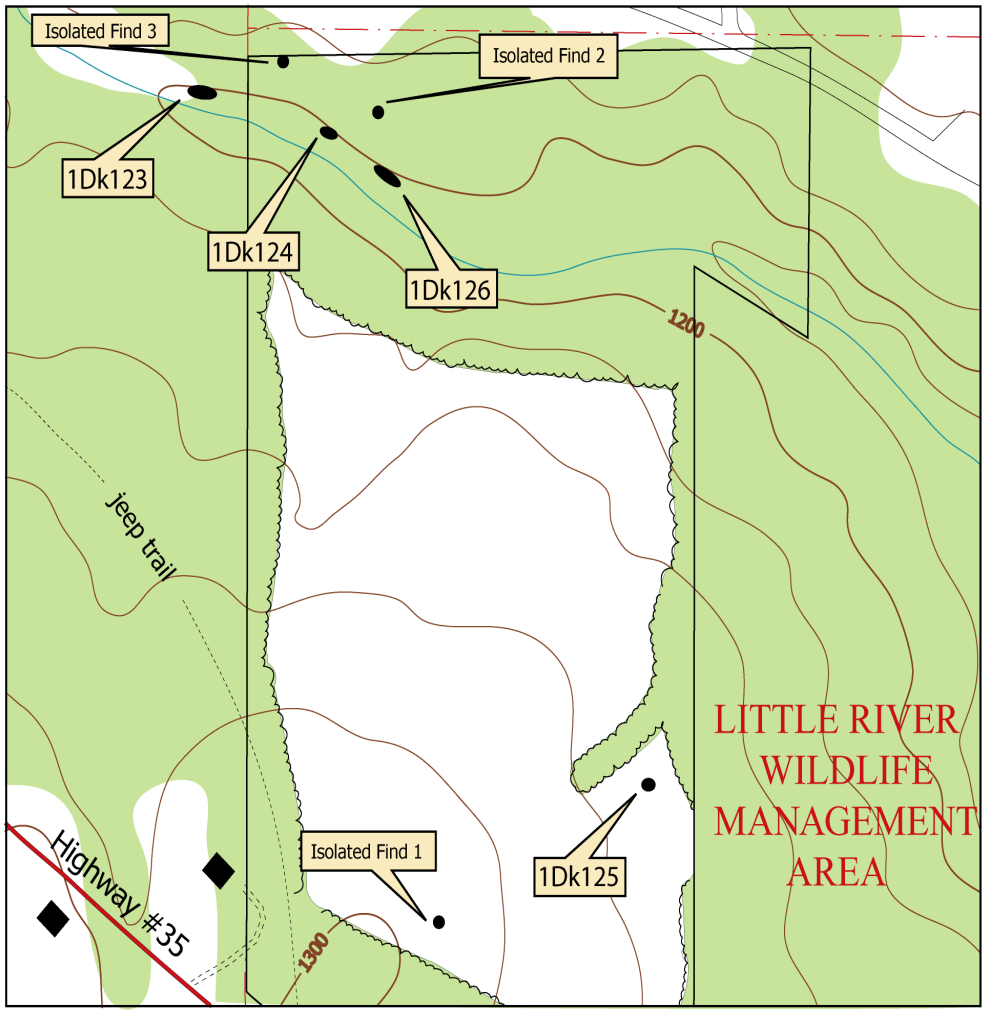
☐ Human Remains	☑ Stone Mound(s)
☐ Features	☐ Weir
☐ Petroglyph/Pictrograph	☐ Quarry
☐ Rockshelter	☐ Standing Historic Structure
☐ Cave	☐ Historic Structure Site
☐ Artifact Scatter	☐ Historic Cemetery
☐ Midden	☐ Still
☐ Shell Midden	☐ Mill
☐ Single Earthen Mound	☐ Engineering
☐ Multiple Earthen Mound	☐ Other

Components

UNKNOWN

Comments

1DK125 WAS RECORDED BY CHUCK BURNS, JACKSONVILLE, AL. THE SITE CONSISTS OF TWO STONE MOUNDS ONE LARGE (3.25 M E TO W, 2.4 M N TO S), ONE SMALL (1.90 M E TO W, 1 M N TO S) WHICH ARE A PART OF AND ENCOMPASSED BY A CIRCULAR TO OVAL PATTERN OF ROCKS (7.15 M E TO W, 5.7 M N TO S). NO ARTIFACTS WERE OBSERVED OR RECORDED WITHIN THE VICINITY OF THIS STONE MOUND. ORIGINS OF THIS SURFACE FEATURE ARE UNKNOWN.



Record Type: ☑ Clear ☐ Master ☐ Synonym

Form Status: ☐ Final ☐ Verified ☑ New

Form Completion: ☐ Final ☐ Map Search ☐ Literature Search

Sponsor Type:	ACA	Sponsored By:	JSU
Recorder Type:	ACA	Recorded By:	JSU
Date Submitted:	2003-12-08	Date Revised:	2003-12-09

Site: DK126 Retrieve Site

Site Name: UNNAMED

Location and Size

Easting: 625532 Northing: 3807395 Elevation: 1141

Township: 07S Range: 10E Section: 30

NW 1/4 of SW 1/4 of NW 1/4

Major Axis: 18 Minor Axis: 5 Max Depth: 0

Location and Size

Preservation State: UNMODIFIED

Immediate Destruction Pending: N Looting/Vandalism: ? % Destroyed: 0

National Register Status: UNDE

Archaeological Information

Level of Investigation: RECONNAISSANCE

Excavation Status: SURFACE & SHOVEL

Topographic Association: UPLAND SLOPE

Physiographic District: LOOKOUT

Physiographic Section: CUMBERLAND

Nearest Water Source: THIRD

Direction To: S Distance To: 7 At Confluence: N

Drainage Basin: COOSA

Ground Cover: UNIMPROVED

Soil Type: MUSKINGUM

Soil Texture Class: FINE SANDY LOAM

County Soil Survey:

Degree of Disturbance: UNDISTURBED

Characteristics

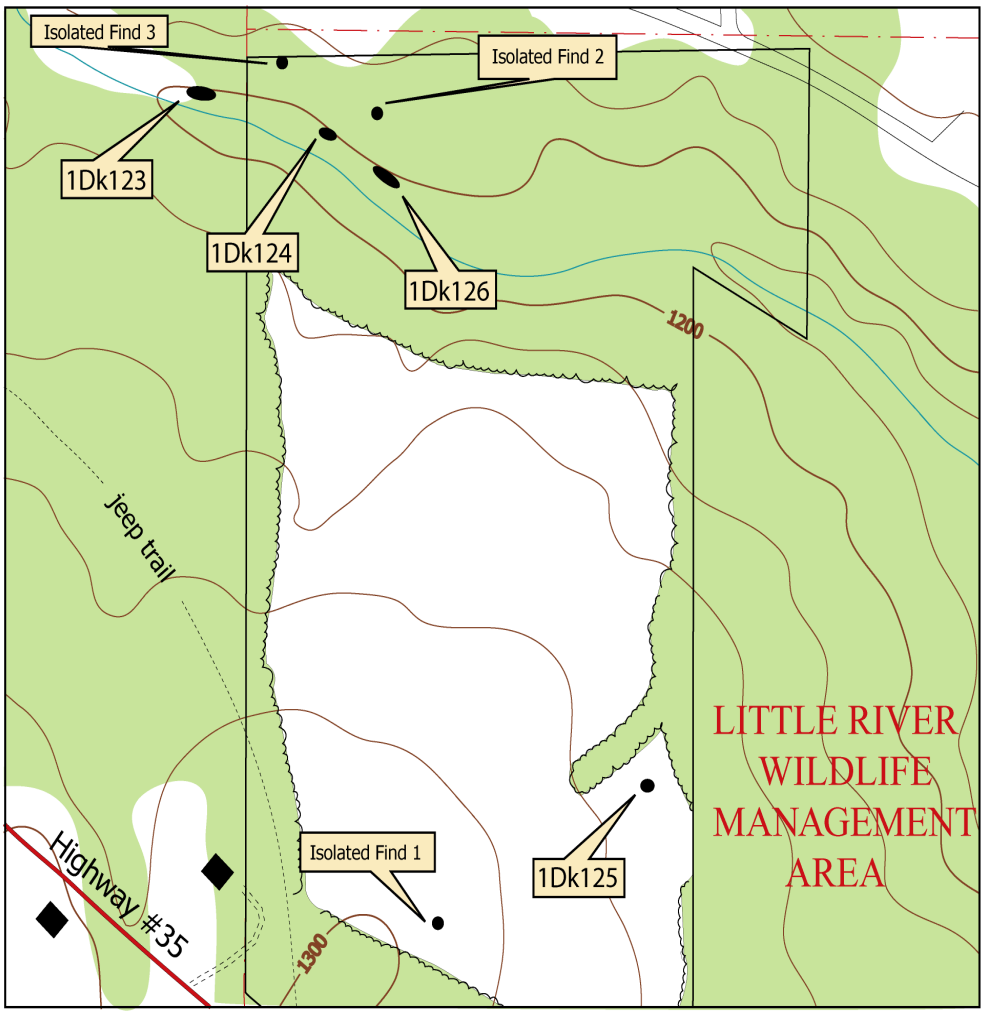
☐ Human Remains	☐ Stone Mound(s)
☐ Features	☐ Weir
☐ Petroglyph/Pictrograph	☐ Quarry
☑ Rockshelter	☐ Standing Historic Structure
☐ Cave	☐ Historic Structure Site
☑ Artifact Scatter	☐ Historic Cemetery
☐ Midden	☐ Still
☐ Shell Midden	☐ Mill
☐ Single Earthen Mound	☐ Engineering
☐ Multiple Earthen Mound	☐ Other

Components

UNKNOWN ABORIGINAL, 20TH CENTURY NONABORIGINAL

Comments

1DK126 WAS RECORDED BY JOHN NOEL AND CHUCK BURNS, JACKSONVILLE, AL. THE SITE CONSISTS OF SEVERAL SMALL TO MEDIUM SIZED BLUFF SHELTERS. ONE SHOVEL TEST WAS EXCAVATED IN THE LARGER OF THE CAVITIES TO FLOOR OF SHELTER (APPROX. DEPTH 15 TO 20 CM); NO CULTURAL MATERIAL WAS RECOVERED FROM THIS TEST. HOWEVER, ONE FLAKE WAS RECOVERED THROUGH SURFACE COLLECTION AND SEVERAL PIECES OF CLEAR MASON JAR FRAGMENTS WERE OBSERVED IN THE ABOVE-MENTIONED CAVITY. THE MASON JAR FRAGMENTS COULD BE ASSOCIATED WITH POSSIBLE MOONSHINING ACTIVITIES.



Record Type: ☑ Clear ☐ Master ☐ Synonym

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APPENDIX D
Acronyms

Acronyms

A/V	audio/visual
ACAM	Air Conformity Applicability Model
ACOE	Army Corps of Engineers
ADCNR	Alabama Department of Conservation and National Resources
ADEM	Alabama Department of Environmental Management
ANHP	Alabama Natural Heritage Program
ARL	Archeological Resource Laboratory
ASSF	Alabama State Site File
AVFD	Adamsburg Volunteer Fire Department
BLM	Bureau of Land Management
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
EA	environmental assessment
EDA	Economic Development Authorioty
EO	Executive Order
EPA	Environmental Protection Agency
EPIC	Environmental Policy and Information Center
ESA	Endangered Species Act
FIFCFS	Federal Interagency Forum on Child and Family Statistics
FIP	Federal Implementation Plan
FPFD	Fort Payne Fire department
FR	Federal Regulation
GLO	General Land Office
GPS	Global Positioning System
HVAC	heating, ventilation, and airconditioning
JSU	Jacksonville State University
L_{eq}	hourly equivalent sound pressure levels
LRCC	Little River Canyon Center
LRCFS	Little River Canyon Field School
MSFC	Marshall Space Flight Center
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NCES	National Center for Education Statistics
NEI	National Emission Inventory
NEPA	National Environmental Protection Act
NESHAPs	National Emission Standards for hazardous Air Pollutants
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NOx	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPR	NASA Procedural requirements
NRHP	National Register of Historic Places
O_3	ozone
P.L.	public law
Pb	lead
PCB	polychlorinated biphenyls

PM	particulate matter
SIP	State Implementation Plan
SO_2	sulfur dioxide
U.S.	United States
U.S.C.	United States Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
dBA	decibels on the A-weighted scale

These units are standard metrics and are not normally included in the acronym list.

*ft	feet/foot
*ft^2	feet/foot squared
*gal	gallon
*gpd	gallons per day
*gpm	gallons per minute
*h	hour
*lbs	pounds
*mi	mile
*V	volt
*wk	week
*yr	year